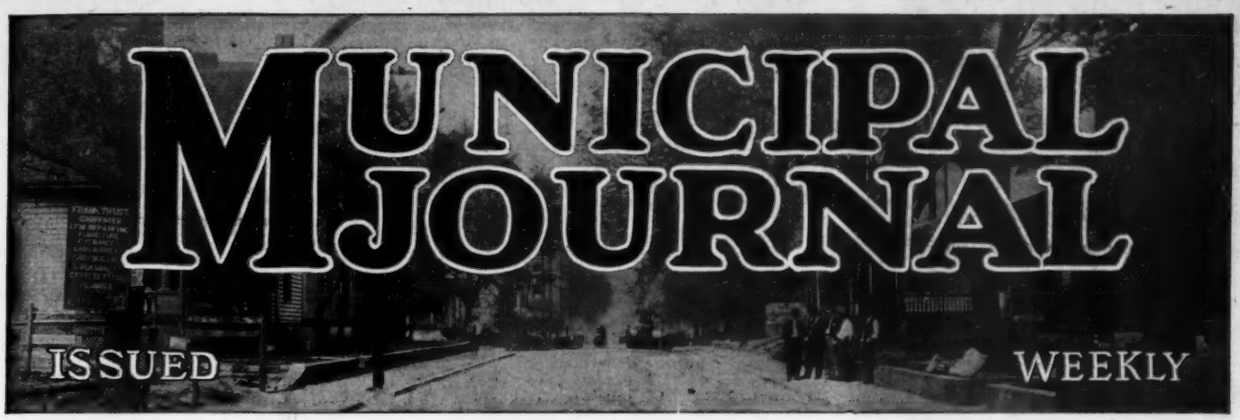

VOLUME XLV
No. 12

September 21, 1918

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(*Photo courtesy N. Y. World*)

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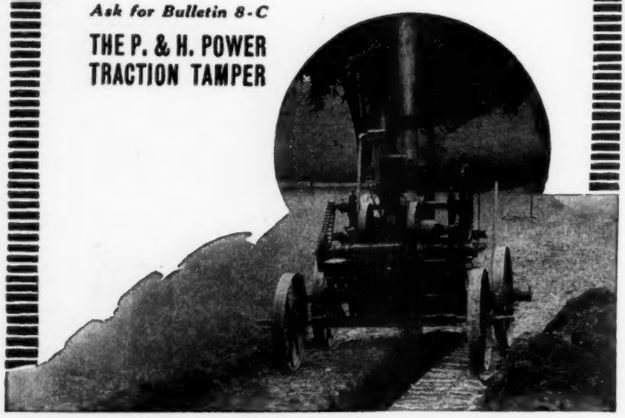

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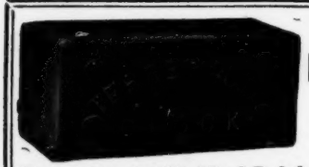

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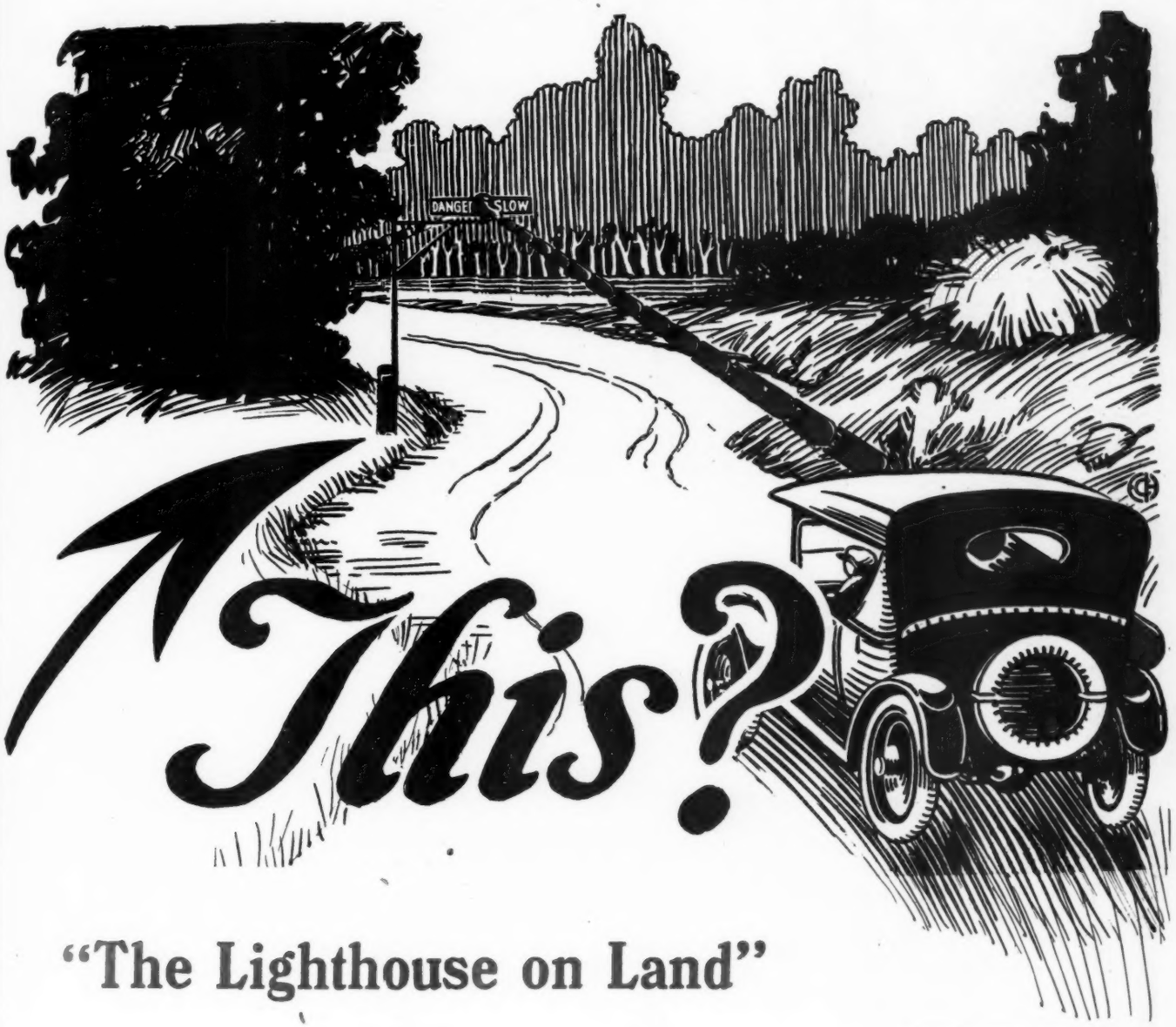

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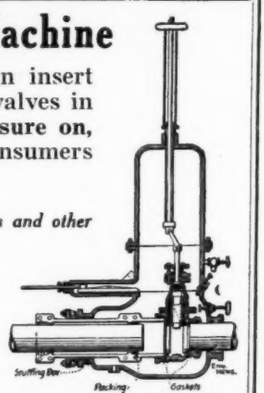


THE A. P. SMITH MFG. CO.

EAST ORANGE, N. J.

Municipal Journal

Volume XLV. NEW YORK, SEPTEMBER 21, 1918 No. 12

SAN FRANCISCO'S HETCH HETCHY PROJECT

Hydro-Electric Power Obtained from New Water Supply Used to Furnish Current in the City and Thus Conserve Coal—Eleanor and Hetch Hetchy Dams, Aqueduct Tunnels and Other Details.

By C. W. GEIGER

San Francisco's Hetch Hetchy water project is now playing its part in relieving in a small measure the power shortage in California. While the Hetch Hetchy project is primarily a water project, the development of a large amount of electricity has been a part of the plan, and when Congress granted to the city the right to use the Hetch Hetchy valley, it specifically provided that a certain amount of electrical energy be developed within a reasonable period.

The city had installed a temporary power plant at Early Intake for the purpose of supplying the electric power required in the construction of the entire project, from the main Hetch Hetchy dam to Moccasin creek, and recently was requested to turn all surplus energy from this power plant into the general pool. As a result the necessary transmission lines were built and it is estimated that the city is now turning into the general pool sufficient electrical energy to operate all of the municipal street car lines.

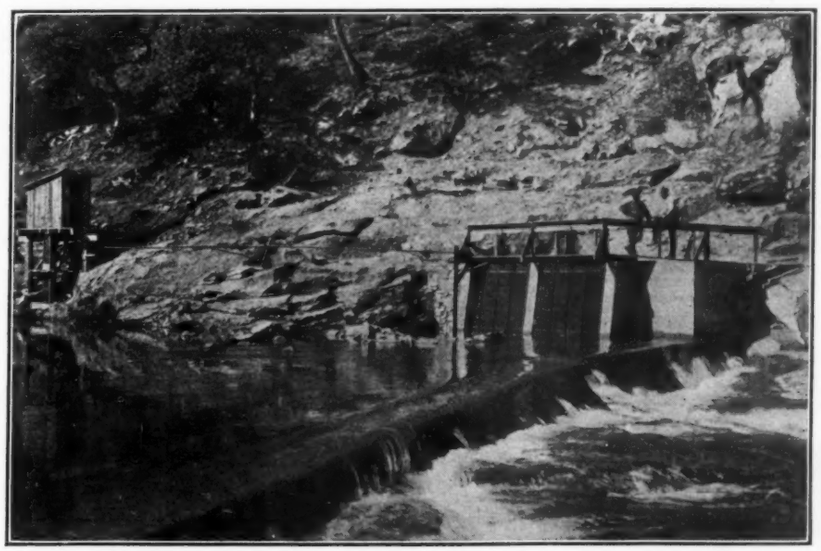
The temporary power plant is known as the Lower Cherry River power plant. Water for its operation is diverted from Cherry creek into a conduit of 200 second-feet capacity 3.3 miles long, consisting of 1.4 miles of open ditch, three flumes aggregating 0.9 mile, and five tunnels aggregating 1 mile. The pressure pipe line connecting the water wheels with the forebay at the lower end of the ditch comprises 530 feet of 42-inch pipe ranging in thickness from 3/16 to ⅜ inch.

The water wheels are Francis turbines operating at 720 r.p.m. under a maximum head of 346.5 feet, including a draft head of 15 feet. These turbines are each direct connected to 2300-volt, 3-phase, 60-cycle generators, with direct connected exciter. The voltage is stepped up through a single bank of transformers to 22,000 volts for transmission to the various substations located along the 19 miles of aqueduct to the west and at the main Hetch Hetchy dam site 11 miles to the east of the temporary power plant.

THE ELEANOR DAM.

To insure sufficient water for operating purposes during the dry season, a temporary dam was built at Lake Eleanor which will raise the water level of that lake approximately 30 feet. Water which will be released through the gates of Eleanor dam will pass down the channel of Eleanor creek to its confluence with Cherry creek, thence will flow in the channel of the latter stream to the diversion works previously mentioned, whence it will pass into the conduit leading to the temporary power plant.

The dam at Lake Eleanor is a multiple-arch structure, having a maximum height of 60 feet, with a length of 1150 feet. In deciding upon the plans for this dam it



DIVERSION DAM AND INTAKE, LOWER CHERRY CREEK POWER AQUEDUCT.

was concluded, in the interest of economy, to build the temporary dam in such a location and in such a manner that it can later be made a part of a permanent dam which will have a height in the future of 150 feet or over.

The design of the temporary dam involves several original features. The central axes of the arches lie in a curve arched upstream in an arc of 30° and extending to the abutments on each side of the creek channel. The axes of the arches lie in planes whose horizontal traces form an angle of 30 degrees. There are 22 arches, each with a span of 40 feet, supported by buttresses heavily reinforced. Approximately 7,000 cubic yards of high grade concrete was required for the structure.

A fleet of automobile trucks were engaged in hauling cement from the Hetch Hetchy railway to the dam site and during pressing periods the trucks were worked day and night, in eight hour shifts, new drivers taking the trucks at each shift. In this way cement was run across the mountains to Lake Eleanor as fast as it was hauled by train to the Hetch Hetchy terminal over the Hetch Hetchy railroad recently completed. From three to four carloads of cement of 40 tons each was hauled by the locomotives over the 68 miles of road to the railway terminal, from which point it was loaded onto the motor trucks. Large deposits of sand and suitable gravel were found within 2,000 feet of the dam site. To furnish the million board-feet of lumber necessary for the forms, a sawmill was erected at the dam site. In addition to this, the city owns a large sawmill known as the Canyon Ranch sawmill, which it is operating in the Hetch Hetchy project. Over 400,000 board-feet of lumber were cut and planed during the spring of 1917.

Three hundred and twenty acres of additional timber land lying a short distance from the Canyon Ranch sawmill were purchased by the city, and it was proposed to cut about 4,000,000 feet more from this land. An agreement was made with the Department of the Interior, however, whereby any or all of this 4,000,000 feet could be cut from selected trees standing on Government land immediately adjacent to the mill. This will not only prove a great convenience to the city, but will also preserve the beauty of the surrounding forest, by permitting of scattered trees being taken from a wider area and consequently no one particular spot will be entirely denuded. The Government will obtain the fee title to this land and to the remaining uncut timber when the city's operations are completed, in full compensation for all timber cut or to be cut in future in the Hetch Hetchy reservoir basin and on Government land surrounding Hetch Hetchy valley.

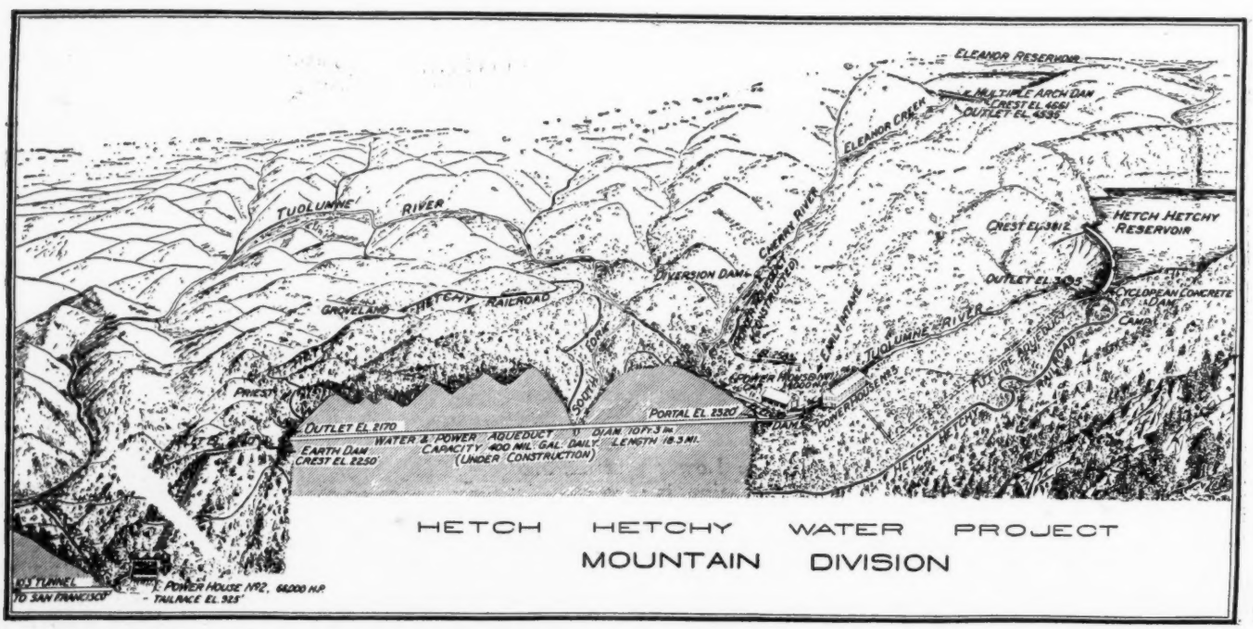
Work on the Eleanor dam and the sawmill was done by day labor under the direction of the city engineer. The work on the dam was completed below the city engineer's original estimate.

HETCH HETCHY DAM AND AQUEDUCT.

The city is very anxious to complete as soon as possible the Hetch Hetchy dam, and the 18 miles of tunnel aqueduct through the mountains, from Early Intake to Moccasin creek power house forebay, in order to secure the income or saving that will result from the generation of electricity to the extent of 66,000 horsepower as an initial installation. The estimated cost of the 18 miles of aqueduct was $6,200,000 and of the Hetch Hetchy dam $4,000,000. Miscellaneous expenses of approximately $800,000 brings the total to $11,000,000. Due to the failure to sell enough bonds, the project is progressing at a slower rate of speed than could be obtained if adequate funds were available. It is claimed that with the 18 miles of tunnel and the impounding dam completed, the revenue derived from the sale of the power that could be generated would more than pay interest on the $11,000,000.

The lowest bid for constructing the aqueduct was $9,233,671, or about 50 per cent more than the engineer's estimate. Consequently the city decided to start work on the tunnel by day labor, and all the equipment for work on the tunnel has been purchased, and all the men (about 400) that can efficiently be used with the amount of money now available are at work on various sections of the tunnel, at ten different points.

The 18 miles of tunnels has been divided into three sections as follows: Section A includes about 4.5 miles from Early Intake to the South Fork of the Tuolumne river. This tunnel can only be worked from the two portals, unless intermediate shafts are constructed. Section B extends from the South Fork of the Tuolumne river about 4.7 miles. The work will be constructed from the portal at the South Fork and from seven adits which



SKETCH SHOWING LOCATION OF MOUNTAIN DIVISION, INCLUDING RESERVOIRS AND POWER HOUSES.

divide the section into seven parts, varying in length from about 0.34 mile to about 1.07 mile. Section C extends from the westerly end of Section B about 9.1 miles to the city's forebay reservoir site. This section will be accessible from the west portal, from the adit at the easterly end of the section, and from two shafts. Work along this section is well under way.

The shafts at some points are from 500 to 600 feet deep, and are generally three-compartment shafts. Electrical energy for all operations is delivered at each shaft, adit and portal. The work lies in rough mountain country. Wagon roads cross the line at several points. Materials are brought by the Hetch Hetchy railroad to the sidings nearest the work. The railroad parallels approximately the line of the aqueduct, so that the work will be accessible from the railroad by short road or tramway hauls.

From Hetch Hetchy reservoir to Early Intake, a distance of 12 miles, the river bed of the Tuolumne will temporarily serve as a conduit for the water released from the reservoir. At the Early Intake is a temporary overflow dam about 45 feet high and 500 feet long, to

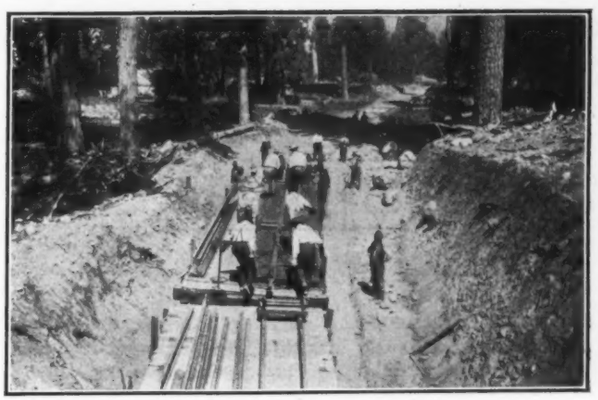
ONE OF THE MOTOR TRUCKS USED IN HAULING CEMENT TO ELEANOR DAM SITE.

intercept the water and divert it into the 18-mile system of tunnels. From the tunnel it will pass to a forebay reservoir of 2,000 acre-ft. capacity, thence to the Moccasin creek power station, previously mentioned as capable of developing 66,000 horsepower. This power plant is about 141 miles from San Francisco and has a net power drop of 1,250 feet. When an aqueduct between the Early Intake and Hetch Hetchy dam has been constructed there will be available another power drop of 1,325 feet.

At its lower end, Hetch Hętchy valley narrows to a gorge about 60 feet wide at ordinary low water level and 900 feet wide at the elevation of the crest of the proposed main dam. This dam will be of heavy masonry, 300 feet high, and will impound 112 billion gallons of water and be the principal storage reservoir of San Francisco's water supply. A force of men is now at work on this dam, which will be completed by day labor.

For the purpose of by-passing the flow of the Tuolumne river during the excavation of the foundation for the dam and the construction of the dam proper, a tunnel 20 feet in diameter and 500 feet long was drifted at the dam site. About 100 feet upstream from the main dam, a diversion dam is being built to divert the river through this tunnel. This tunnel was finished at a cost of approximately $5.00 per cubic yard of rock excavated, which was considered very satisfactory.

Unlike much of the mountainous country in that region, portions of the Hetch Hetchy valley are densely wooded. All trees and vegetation are to be cleared from



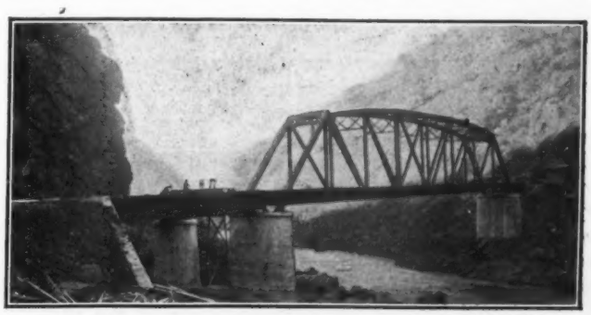
UNLOADING RAILS IN CONSTRUCTION OF HETCH HETCHY RAILROAD.

the area to be flooded by the reservoir, and this has already been completed on that area to be flooded when the diversion dam is completed.

HETCH HETCHY RAILROAD.

All construction equipment and material used on the mountain divisions of the aqueduct as well as in constructing the dams is carried in by a railroad built especially for the purpose, called the Hetch Hetchy railroad, which cost $1,850,000. In laying out the route the possibility was considered of opening up new timber land, and it is anticipated that in the near future all cars carrying material for the aqueduct or dams, which would otherwise return empty, will carry loads of lumber from private sawmills and thus earn an income.

This railroad leaves the Sierra Railway of California at an elevation of 935 ft., drops 625 to the Tuolumne river, which it crosses and follows for several miles, then leaves to climb up to the dam with grades of 3 to 4 per cent. Heavy cuts were avoided by sharp curves, many of 18 degrees to 26 degrees and a maximum of 30 degrees. On the way to the dam the road attains an elevation of 5,024 ft., 1,155 above the dam, through which distance it falls on a 4 per cent grade. The construction involved the excavation of about 250,000 cu. yds. of rock and 750,000 cu. yds. of earth, and the use of 500,000 ft. B.M. of lumber for trestles. All the material was excavated under one classification at a contract price of 67 cts. a cubic yard. The roadbed is 16 ft. wide, except nine miles, which is 22 feet. Sixty-pound rails were used. Three motor trucks have been equipped with flanged wheels for service on the Hetch Hetchy railroad. These trucks carry their own turn table, which is fastened to the bottom of the truck. By means of this turntable the truck is raised so that the wheels clear the tracks, and the truck can then be turned easily. Chains are applied to all four wheels in such a manner that the springs are kept from straighening out when the wheels are raised off the ground. Special pony trucks were built at the municipal railway shops for the front of the



TUOLUMNE RIVER BRIDGE ON HETCH HETCHY RAILROAD.

autos. Sand is carried in a box just above the rear wheels, and on heavy grades is forced onto the rail by compressed air supplied by an air compressor operated from the main drive shaft by chain drive. Special brakes have been designed which are operated by an emergency lever. The trucks can make 15 miles an hour and can be converted back into a road machine in an hour or two.

WATER WORKS OPERATION.

Conclusion of Discussion of Electrolysis and Means of Prevention and Mitigation—Miscellaneous Expedients—Electrolysis Surveys—Regulation of Electric Railways.

OTHER EXPEDIENTS.

The Bureau of Standards is strongly opposed to the grounding of the negative bus or the tracks near the power house as tending to greatly aggravate the trouble from electrolysis.

Where good voltage conditions in the negative return are maintained, the insulated negative feeder system (comparable to plan 12) can in most cases be installed so as to allow far greater economies both in installation and operation costs than is possible with uninsulated feeders. Negative feeders already in use which are so laid that they cannot be insulated will not be used any less efficiently if supplemented by insulated feeders, provided equally good voltage conditions in the track are maintained in both cases.

What is known as the three-wire system has been advocated, but its practical value remains yet to be demonstrated. The cost of converting a railway to this system would in many cases be prohibitive, and there are certain operating disadvantages attached to it. Viewed solely from the standpoint of electrolysis, it possesses large possibilities and experiments with it are urged. Up to the present time, however, sufficient experience has not been had to show that it is practicable from the operating standpoint.

As the distance between power houses and substations is increased, the tendency of pipe lines to take up current from the earth under a given potential gradient increases much more rapidly than the distance of transmission. In fact, it can be shown that the current picked up by the pipes may increase as the second or third or even a higher power of the distance between feeding points. Any increase in the number of feeding points or, more properly speaking, in the number of drainage points will reduce in a much greater degree the flow of stray currents in the pipes. (Compare with plan 13.)

ELECTROLYSIS SURVEYS.

By means of proper measurements it is possible to determine with sufficient definiteness for most purposes the extent and location of the area in which pipes and other structures are in danger and the degree and seriousness of the trouble. Such survey may detect defects in the railway return system which might produce electrolysis trouble, high resistance in pipe systems, low-resistance soil, etc., thus offering suggestions of methods for reducing the danger.

If the purpose of the survey is to furnish data for applying corrective measures, a complete electrolysis survey should be made, but not so extensive a survey would be needed if the aim is merely to determine whether ordinances or regulations governing electrolysis conditions are being complied with. A complete electrolysis survey should include the determination of the type of joints and the kind of material used in the pipe lines, the size of mains, etc.; weight of rail, type of bond and joint used, and road bed construction; the character of the railway service, whether city, suburban or interurban; the practice of the railway company in regard to frequency of cross-bonding, bond maintenance and bond test; load curves for estimating all-day or other average values from short-time readings; as well as complete data on the magnitude and distribution of load, generating and sub-station feeder systems, frequency of schedule and probable future demands of traffic, these last being necessary for determining the best method of correcting undesirable conditions.

The interpretation of such tests requires long experience and thorough familiarity with the subject. As a rule no single set of readings can be interpreted by itself alone, but it must be judged by considering the effect of a variety of other conditions. For this reason, no mitigation measure should be undertaken except on advice of an unbiased expert who has had considerable experience in the study of this subject.

ELECTROLYSIS REGULATIONS.

Long experience both in America and abroad has shown that some form of regulation is necessary for protecting underground pipes and cables and that such regulations can be made very effective. One of the most essential features should be an appropriate limitation of the potential drops in the railway track network or in the earth and pipe systems, and that such limits should be applied in the case of railway tracks to both the over-all potential drops between remote parts of the system and also to potential gradients in relatively short portions of the track network, the former being necessary to guard against the accumulation of large potential differences which might occur even with low gradients, provided the feeding distances are very long, and the latter to prevent the very rapid change in the voltage of the track in any portion of the system which might give rise to bad local conditions even if the over-all potentials were kept comparatively small.

The average all-day voltage drop in railway tracks under average conditions should be restricted to a value not exceeding 2 to 4 volts, the lower value applying to localities such as business centers in large cities, where the underground utilities are highly developed and of great value, and the higher value to those regions in which the utilities are developed to a lesser extent, such as the average residential districts in cities. These average values would, in the case of the majority of railway loads, correspond to an average during the maximum hour of from 3 to 10 volts, there being a greater variation in the values for the shorter than for the longer period. The average 24-hour gradient at any point in the rail should under average conditions not be permitted to exceed about 0.3 to 0.4 volt per thousand feet. These limits for the 24-hour period correspond roughly to 0.4 to 0.5 volt per thousand feet for the 18-hour operating period. If the drop of potential on pipe or earth is made the basis of limitation, lower values would have to be used, and on the average, over-all potentials and potential gradients in the earth should be maintained at about one-half of the figures given above in order to insure the same freedom from electrolysis.

There is considerable difference of opinion as to the manner of specifying the limiting voltages which should be allowed, some preferring to specify a limit for momentary voltages and others to restrict the maximum value for some definite short period such as 10 to 30 minutes during the peak-load period, while many prefer to follow the practice of specifying an upper limit for

the average voltage during the operating period. The Bureau of Standards prefers the last plan, its investigations having shown that the actual amount of corrosion that takes place is much more nearly proportional to the average all-day load than to the short-time peak value. In fact, its investigations show that as the load increases and the current density is thereby increased, the actual amount of corrosion does not increase as fast as the current increases. For this reason it is undesirable to place a heavy penalty on a high peak of short duration provided the average current is small. This objection is avoided by specifying the average value of the voltage instead of some short-time peak-load value.

A large part of the above is abstracted from a recent digest of the publications of the Bureau of Standards, dealing with electrolysis of underground structures, which has just been published and copies of which may be obtained by application to the Bureau of Standards, Washington, D. C. In this the theory of electrolysis is discussed at much greater length.

SEWAGE PUMPS AT NEW ORLEANS.

In his annual report for 1917 relative to the operation and maintenance of the New Orleans sewerage system, George G. Earl, general superintendent, says:

One of the most encouraging features of the Board's operations during 1917 was the result in operation of the installation of the new trash pumps at three of the seven existing relifting sewage pumping stations. It is vital to maintain the satisfactory automatic operation of these systems; with rags and trash entering the sewers in large amounts no pump handling unscreened sewage has heretofore given at all satisfactory results, and unless a pump could be devised to meet this trouble it was clearly seen that attendants and a screening-removal service would have to be provided. This would cost over $30,000 per annum for the existing seven stations and over $80,000 per annum by the time the present drained area of the city is fully served. The new pumps designed by Mr. Wood for this work have entirely eliminated any trouble of this character. Unscreened sewage is pumped by them with a higher efficiency than clear water was pumped by the original sewage relifting pumps, and there has not been a single case of pump obstruction or of decrease of pump efficiency due to trash obstructing these new pumps. There results, therefore, not only the certainty that attendants will not be required at these relifting stations but also a very materially increased economy in power consumption.

In his report on this matter as mechanical engineer in charge of the pumping stations, A. B. Wood said:

The new sewerage trash pumps at this Station (Station No. 14) have been in continuous service for the past six months, and this station now represents a distinct step in the solution of the problem of automatic sewerage operation by pumping.

All pumps previously available for this class of service were unable to handle rags or similar trash which finds its way into the sewers, requiring frequent stops for cleaning and a very considerable reduction in average capacity and efficiency, due to clogging of the runner passage.

In actual practice there was required for handling the sewage of this station the continual operation of two 14-in. sewerage pumps, consuming together a total of 40 kilowatts for their operation. They also required cleansing twice a day to maintain tolerable conditions in the intake sewers.

It was becoming evident with the increase in the number of sewer connections that unless this problem could be solved the automatic operation would have to be abandoned and the city placed to the expense of providing shifts of operators at each of the seven existing sewer stations.

This department designed a new type of pump as a solution of this problem. This pump of normal 12-in. size is capable of handling a solid sphere 12 inches in diameter, rags, sacks or similar trash in any quantity capable of entering the suction inlet without any chance of choking the passages or damaging the pump.

In actual service the pumps at this station have never been cleaned out, handling the raw sewage continuously and discharging at their rated capacity.

It was hardly expected that the highest efficiency could be obtained on such a design, but careful tests with weir measurements and with velocity check have demonstrated an unusually high average efficiency. These tests were made while the pump was in regular service in pumping unscreened sewage.

On another page will be found the results of these tests and especial attention is called to the uniform efficiency over a large range of head, such as is actually obtained in intermittent operation.

As a practical example of this efficiency, one pump consuming 25 kilowatts for about two-thirds of the time does superior work to the two old pumps operating continuously at 40 kilowatts input, besides saving the time and expense of cleaning. Eighteen pumps of this design are being installed as rapidly as possible in the other automatic stations.

The result of tests referred to is as follows:

Test of New Sewage Trash Pump Sub-station No. 14, December 8, 1917.

Water Measurements by Venturimeter.

Head on Pump	Quantity, Cu. Ft. Sec.	Efficiency, Per Cent.
22	0.5	..
20	2.4	..
19	3.5	46
18	4.8	56
16	6.5	68
14	10.5	70
12	13.6	70
10	16.8	67

AN AMERICAN ENGINEER IN FRANCE.

Observations of an Officer of Engineers of the United States Army Concerning the Paving of Streets and Highways in That Country.

The following are extracts from a letter received by the editor from a friend who is Major of Engineers, Superintendent of Roads, in charge of one of the sections of roads in France being used by our army and maintained by it. Aside from the personal matter (which is omitted) this letter contains so much that is of interest to municipal and road officials that we believe it will be read with interest by all such. The writer left the United States in September, 1917. His first three months abroad were spent in Paris. Concerning this city he says:

Unlike our American cities, Paris is entirely paved. The streets are even better than the sidewalks. The old pavement were stone blocks and many of the streets are still paved and maintained in good condition with these blocks, called "pavés." There are miles and miles of rock asphalt in extremely good condition. But the heavier traffic streets are now paved with wood blocks, which cover many miles of street and are apparently very popular.

Many of the sidewalks are of stone slabs, but rock asphalt also has been used very extensively. The asphalt is laid directly upon the ground with no foundation other than well tamped gravel. And instead of 2 inches, a thin surface of usually not more than an inch is used. The walks seem to give very good satisfaction and it is seldom that one can be discovered in bad condition.

The street cleaning is done largely by means of the rotary broom, but the sidewalks and gutters are cleaned in a very unique manner. A broom of long reeds is used and the gutters are actually washed. At the various intersecting streets a hydrant is placed so that the water may run to the gutters in at least two, and often three, directions. These little hydrants are placed in the sidewalk, opening into the gutter through the curb. A flood of water is turned on and a small dam is made in the gutter to force the water to flow only in the desired direction. Then with the long handled brooms the streets are washed by the street cleaners. All of the refuse is washed into the sewers and carried into the Seine.

The street cleaners, at the present time, are mostly women. A few colonials from the French north coast of Africa are used, but the greater portion of the work falls upon the women. When they have finished a block of streets, often the gutter and pavement is cleaner than the sidewalk.

Ashes and dry garbage are placed in cans at night or early morning and set on the walks in front of the houses. The contents of the cans are collected in wagons each

morning and hauled to and dumped on a quai at the Seine. Then it is loaded by hand into the barges and carried away.

There are many children, old men and old women who search the ash and garbage cans for anything of value in any way. They are veritable rag pickers, but take paper, rags, green stuff for chicken or stock feed, bottles and anything that can be turned to value. In searching through the cans a great deal of ashes and filth is left on the sidewalks and in the gutters. Early in the morning, the walks are, in consequence, quite dirty and it is a relief when the street sweepers do their work.

I did not have an opportunity to visit the sewers of Paris, but hope to be able to return one of these days and make the trip. I had made arrangements with the Engineer Department to go, but the weather turned out so bad that the trip was deferred until later.

But the interesting part of my experiences over here is the work for which I came over. Not knowing what I was to do, the three weeks' journey was one of wonder. Having, as you know, done nothing but municipal and road work since 1904, I naturally hoped to be placed on road work in some capacity. Consequently, when I was assigned to the Road Department, October 13, I was greatly pleased.

For three months, being one of the early arrivals, most of my time was spent with requisitions, personnel and future plans. And, believe me, this was some job! I believe we requisitioned everything that could be thought of in the way of road tools and implements. In addition to our requisition work, we had a force of officers scouring Switzerland, Spain, France and England for anything that could be used.

In January, owing to rapidly wearing roads, and no army in the field, our services to the rear were divided into two little and one big sections, and I was given the big one. Through my section the roads were very good (last January). So I was given only a few men to care for 600 miles or more of main roads. Most of my work, until lately, has been to fix up agreements and understandings with the Ingenieurs des Ponts et Chaussées (the French Road Engineers) and to secure rock. Lately we have begun work in earnest and now have some considerable force at work. Necessarily, our work is macadam patch work for we cannot spare boats to get tar or asphalt. If we could, it would be an easy proposition, for most of the roads are in ideal condition (or were in the Spring) for bituminous surface treatments, such as are so successfully used at home.

France has a variety of road building material and in my section nearly every kind has been used. But the great majority of the roads have been built with local lime rock, so prevalent over the greatest part of the nation. In the Vosges Mountains is found splendid trap rock and some good quarries are in operation. In a number of districts, east and south especially, are found splendid granites. Then there are some blue lime rocks, quite hard, and various qualities of sand stone. These, with the soft white lime rock, so prevalent everywhere, furnish most of the road building materials. In a few places a very excellent quality of gravel is found and used, but gravel is not used extensively.

On account of the predominance of the material, most of the roads are built of lime rock. When the quality is good, very good roads have resulted. But where a softer rock has been used, the roads are not so good. Where the harder rocks, as trap and granite or volcanic material, have been used most excellent roads have resulted.

Excepting in and around the larger cities, automobile traffic in France has not been heavy, so that the water-bound macadam roads have sufficed. Then, too, labor has been the cheapest commodity (excepting red wine and cheese) found in France, so that continual maintenance has not been costly. Again, the nights in summer are very cool and during all the year there is a great deal of moisture in the ground, so that the macadam bond is very good. The wonderful trees alongside the roads lend aid, too, in shading the roadway and retaining the moisture.

The main roads are divided into two general classes, National Routes and Departmental Routes. The National Routes are controlled and cared for by the state. They are wide, well built thoroughfares, the roadways running usually about 6 meters in width. Some of them are considerably wider. The roadway is also quite wide, at least 12 meters always being used between ditches. The roadway is generally macadam and built of the best rock obtainable. Very heavy construction is done, the base being a well laid Telford, usually laid by hand, of softer rock than the surface and settled in place with hammers. The upper or wearing surface is built of carefully selected rock and plenty of water is used.

The French roller (compresseur à vapeur) and its continued use until desired results are secured is the machine which finishes the well built road. These big steam rollers weigh from 16 to 20 tons and when the roller men finish their work, a perfect water bound macadam road is the result.

All these National Roads are built and maintained under the supervision of the state. The chief of the road service is in Paris and he has a representative with his staff and personnel in each of the 86 departments of France. The department is one of the political divisions of France. It is not so much like a state in form of government, although some of them are quite large, but more nearly resembles a county in our form of government than a state. The Ingenieur des Ponts et Chaussées, as the chief of the road service in each department is called, is supreme on all matters concerning the bridges and roads which come under his supervision.

The other class of roads—the Department Roads—are of three kinds, depending upon their relative importance. They are called Chemins de Grande Communication, Chemins d'Interet Commun and Chemins Vicinaux. The first two are known by the letters G. C. and I. C. Very little difference in construction is made between the G. C. routes and the National Routes. They are not so wide, however, as the National Routes and generally lead directly off from a National Route and quite often connect two National Routes. The average widths are a total for the road bed of 11 meters, the metal surface being 4½ meters and the shoulders 3¼ meters each.

Next in importance is the Chemin d'I. C. which averages 7 meters in width, the metal being but 3½ meters. These roads are of only secondary importance and are not built as heavy as the G. C. Routes.

The Chemins Vicinaux are all routes carrying some general traffic but are of only minor importance. They are lightly built and average 6 meters in width, the metal being 3 meters. We would call these neighborhood roads.

Whether the route is "N.", "G. C.", "I. C." or "V" it is always paved. The customary paving is water-bound macadam grading up from that of soft lime rock to the finest trap. On some of the very heavy traffic main routes, notably those leading toward Paris, a penetration treatment of tar has been successfully used. And near Paris, several of the leading roads are paved with the stone blocks or "pavé." Through all the little towns is found considerable pave. But the interesting fact is that every road (not nearly every one) is paved.

An interesting feature to me is the fact that under the heavy army truck traffic the tar-treated macadam seems to stand up better than the pave. The tarred macadams, of course, are well built and thoroughly compressed to a perfect surface with 16 to 20 ton rollers. This makes a hard and very durable wearing surface if good rock has been used. The pave is not constructed like Morris Sherrerd and Bill Howell construct block pavements. The stones are hand cut and even, but are laid on a gravel foundation. They are well built and well rolled and make an excellent road, of course, but they do not stand the traffic like the tarred macadams. A day or two, coming out of Paris, we were running along about 18 or 20 miles per hour and pretty well jolted. When we ran off the pavé on to a tarred macadam my chauffeur picked up to from 30 to 35 miles right away. With me was another officer, a former California highway official. We both commented on the difference in the two road surfaces. Of course, the tarred macadam is not all perfect, now, nor is all the pavé very bad. But these conclusions are the results of observations on a number of different routs subjected to heavy army truck traffic.

You know I have always been inclined, more or less, to favor bituminous pavements and roads. And my observations over here have strengthened my belief in them, when they are properly built as the French built them. I have contended that it was a crime to tear up the good gravel and macadam which have cost so many millions of dollars. These roads can be successfully treated the same as the Leon Springs road at San Antonio, and as many others in Texas and elsewhere have been treated. The Leon Springs road was not even a well built road, as roads are built here, but it carried the heavy army traffic to the Leon Springs training grounds from San Antonio. And now, over here, I find the same conditions. Brick roads and concrete roads are very fine where traffic actually demands them. But where so much money has been spent

for macadam and gravel, more value can be obtained by surface-treating the already good roads. I am learning from the French conservation, and this is one way to conserve our finances and, to my mind, a very important way.

(To be concluded)

ANN ARBOR'S PAVING EXPERIENCE.*

Twenty Years' Experience with Brick, Asphalt Block, Dollarway and Other Pavements—Mistakes Made and Remedies Adopted.

Ann Arbor, although not a large city and having a comparatively small pavement mileage, has had quite varied experiences in paving and pavements and has furnished a very good opportunity for studying the different types laid there. While it would be more pleasant to relate only successful experiences, the most valuable results are learned from experiences which are more or less unsuccessful; although it must not be judged from these remarks that Ann Arbor has no good pavements, for many of them are in excellent condition and some of the unsuccessful ones have not caused much inconvenience to the traffic using them.

Brick on Concrete. The first brick pavements in Ann Arbor were laid in 1898 and 1899, soft filler being used. This pavement is twenty years old this summer and is in fair condition for a pavement of this age, although somewhat rough, due to unequal settling of the individual bricks. It disproves the contention of bituminous filler advocates that the use of such filler would prevent longitudinal cracks and the breaking of brick in a pavement of this kind, for a great many of the bricks in this pavement have been broken, so that a longitudinal crack is formed in many places.

Asphalt Block. From 1900 to 1903 inclusive asphalt block laid on a compacted sand and gravel formation was tried on some of the most heavily travelled streets in the city. By 1908 it became necessary to do something to preserve it and it was given a carpet coating of tar and sand. This coating adheres very well to the asphaltic surface of the block and has prolonged the life of the pavement many years. Such a coating lasts about four years on these streets. (It may be said here that Ann Arbor has learned that patching of a pavement should always be done with the same material as that of which the pavement was constructed. Repairing of asphalt block streets with vitrified brick or concrete was an absolute failure.) During the past three years three blocks of this pavement have been replaced with vitrified brick on concrete, these being the most heavily travelled streets. Where traffic is not so heavy it is proposed to use the asphalt block as a foundation for a surface of asphaltic concrete or sheet asphalt.

Dollarway Pavement. From 1909 to 1914 the more or less famous Ann Arbor tarred concrete or "Dollarway" pavement was laid exclusively. The first pavement of this type contained 1880 square yards. The materials were purchased and construction done by the city, at a cost of $1.03 per square yard, including curbing and grading, or 78c per square yard for the pavement only. When this became generally known to the citizens, all parts of the city petitioned for this kind of pavement and the city started laying it as fast as possible with the machinery and labor available. During 1910 and 1911 58 per cent of all of this type of pavement now in the city was laid, everything being sacrificed to first cost. Continuous mixers replaced batch mixers, cement was seldom tested, bank-run gravel was used without screening or washing and there was not sufficient or sufficiently competent supervision or inspection to insure that even the best of this was obtained. In addition, the pavement was made six inches thick instead of seven. On one section three blocks long of a comparatively heavy travelled street, the pavement was mixed one part cement to more than five parts of bank-run gravel. It was found that the carpet coating would not adhere to this lean mixture. No reinforcement was used nor were expansion joints protected in any way, nor was care taken to see that these joints were opened and cleaned to the full depth of the pavement.

It soon became evident that it would be necessary to recarpet the concrete every two or three years, and in some cases even every year. Automobilists objects to having tar and sand thrown up onto the under side of the fender. In some places where the carpeting peeled off the concrete commenced to ravel and sections of different sizes had to be cut out and replaced. It was realized that reducing the first cost to a minimum had caused a heavy burden of maintenance and repair, and after 1911 the pavement lost much of its popularity. Still, in 1913 and 1914, some of this type of pavement was laid, but greater precaution was taken in selecting the materials. During 1914 only washed sand was used in the top course and care was taken to have open expansion joints the full depth of the concrete and filled with a standard bituminous filler, and results show that the greater care and cost were justified.

Carpet Coating Experiments. The city has made several experiments to determine the best bituminous material for carpet coating. It was found that Bermudez asphalt in winter became brittle and scaled from the concrete. All grades of coal tar, from the crude product to that with considerable refining, were tried and it was decided that that refined only sufficiently to drive off the water and lighter oils was best adapted to the conditions in Ann Arbor. The crude tar was purchased at the local gas plant and refined sufficiently by heating it to 220° F. to 250° F. as it was applied to the concrete. In 1911 a bitumen was purchased from the Barrett Manufacturing Company with about the same amount of refinement as their lightest grade of Tarvia, but it showed no better results than those obtained from the local tar, although application of the refined tar was somewhat easier because of the frothing and boiling over of the crude tar while being refined. The question seems to be whether a city wishes to refine the tar as it applies it to the street or pay the added cost for tar already refined.

At one time the tar was applied by first sweeping the road with a rotary broom, applying the tar with a gravity tar spreader followed by an automatic sand distributor. At another time the pavement was swept by hand, the tar applied with pouring pots and squeegees and the sand spread with shovels. Various combinations of hand and machine work were used, and in one case the concrete was sprinkled with water before applying the tar.

We have concluded that the surface to be carpeted should be thoroughly dry and free from dust and that the tar should be applied sufficiently hot to be in a thoroughly liquid state. Whether the tar and sand are applied by machine or by hand does not affect the lasting qualities so much as does the temperature of the concrete to which it is applied, and this work should be done during hot, dry weather. A one-size gravel, screening between the one-eighth-inch and one-quarter-inch screens, gives better results than was obtained with other sands and gravels tried.

Expansion Joints. The distances between transverse expansion joints were varied between twenty-five and

*Abstract of a paper before the Fourth Annual Meeting of the City Managers' Association, by Manley Osgood, city engineer of Ann Arbor.

fifty feet. The longer blocks cracked approximately in the center, and it was concluded that a spacing of thirty feet was best. A construction joint was almost invariably left in the center of each street but no expansion material placed therein. The expansion joint along each curb was usually about one inch wide. Many of the blocks have cracked longitudinally between the center construction joint and the curb. It is perhaps unnecessary to say that each individual joint or crack must be covered with tar or sand unless the entire surface is carpeted.

Headers. In 1914, two blocks of asphalt block on sand foundation were removed and replaced with vitrified brick on concrete, but headers were not placed at the ends of the improvement, the brick merely butting against the asphalt block pavement at one end and bitulithic at the other. There has been a very considerable movement of the brick from the center in each direction, although at one intersection where this pavement was butted against another brick pavement on concrete foundation no movement has taken place. Since then we have been very careful under such conditions to firmly bind the ends and sides of new pavements with stone or concrete headers or curbs.

Since 1914 the city has confined itself to standard types of pavement—reinforced concrete, asphaltic concrete on cement concrete foundation, vitrified brick on concrete foundation; and also has changed from municipal to contract work.

HYDRATED LIME IN CONCRETE ROADS.

A field test has been made by G. W. Hutchinson, testing engineer for the Delaware State Highway Department, the object of which was to determine the effect of adding hydrated lime to concrete in road construction. The conditions under which laboratory tests are made, and the fundamental theory of such tests (that for each material or mixture tested the treatment should be that calculated to give the best obtainable results) are so different for ordinary construction conditions and practice that it is conceivable that conclusions derived from the former may not be applicable to the latter.

The great difficulty in making comparable field tests is that of duplicating conditions that would probably or unsuspectedly affect the result. In this case all the test specimens were made by the same machine and operators, using the same materials, and the consistency was judged by the same three men to be similar in all the specimens. The taking of the specimens was described by Mr. Hutchinson, in his report to Chas. M. Upham, chief engineer of the State Highway Department, as follows:

> The specimens were 6 in. x 12 in. cylinders and were made at the same time the concrete was being placed upon the roadbed. A chute mixer was used. The cylinder form was filled by holding it under the chute and deflecting the flow of concrete from the road into the form. All specimens of one mixture were taken from the same batch in the mixer.
>
> Consistency of the mixture was determined by the inspector and myself in accordance with our ideas of an ideal working consistency. The amount of water was not measured as it was not practical under the circumstances, but the same consistency was maintained during the mixing by the agreement of opinions of the man running the mixer, the inspector and myself; that is, the specimens were poured when the consistency was unanimously agreed to by the three parties as being the same as that of the previously made specimens.
>
> The specimens were not tamped, but were struck off on top and then were covered in order to protect them from the rays of the sun, this being identical with the treatment given the road. After being covered for 24 hours, they were buried at the side of the finished concrete road, and at the time when moist earth was thrown on the road the specimens were included under this covering. They were left in the place until they were six months old and received the same treatment as the road during this period and then were taken to be broken.

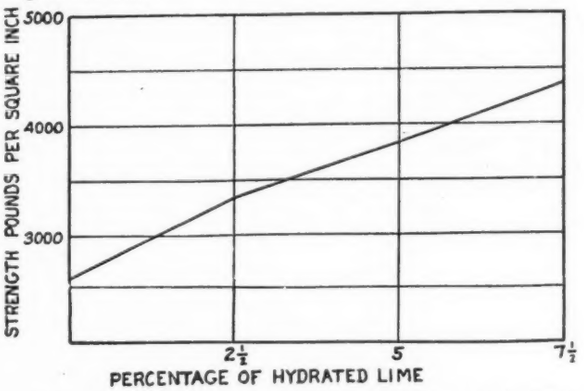
As the tests were started in November, it will be seen that the specimens were subjected to the fall, winter and spring periods.

At the end of six months the test cylinders were tested for compressive strength in the laboratories of the Henry S. Spackman Engineering Co., with the following results:

Compressive Strength of Cylinders in Pounds Per Square Inch.

0% lime	2½% lime	5% lime	7½% lime
3108	2908	3596	3514
2203	3640	4381	5092
2529	3476	3473	4498
2613 Avg.	3341 Avg.	3816 Avg.	4368 Avg.

The percentages of lime are based upon the weights of lime and of cement, respectively. That is, in the last column, 7½ pounds of hydrated lime were added to each bag of cement.



AVERAGE COMPRESSIVE STRENGTH OF CONCRETE CONTAINING DIFFERENT AMOUNTS OF LIME.

In commenting upon this test, the Lime Association states that contractors generally use too much water in concrete, their object being to make the concrete flow easily; while the engineers, knowing that too much water weakens a concrete, endeavor to limit the amount of water used; that the use of hydrated lime improves the workability of mortar and concrete, while, being hygroscopic, it absorbs the surplus free water, yielding to the cement whatever it may need for hydration as it needs it; and that thus it affords a means of satisfying both engineer and contractor. The greater strength of the specimens to which hydrated lime was added is explained by this diminishing of the injurious effects of surplus water, and also, probably, by the greater density of the specimens because of the greater fluidity contributed by the lime. (It will be noted that the specimens were not tamped.) It is believed, therefore, that the advantages of lime are greater in actual construction than would be indicated by tests made under laboratory test conditions where the amount of water can be accurately limited, specimens are well tamped and are kept in moist closets or under other ideal conditions.

HIGHWAYS FOR COAL HAULING.

The U. S. Fuel Administration has publicly endorsed the efforts of the Highways Transport Committee to stimulate and facilitate the use of highways for the transportation of coal, recommending that, where possible, coal be hauled directly from mine to consumer by all available vehicles, horse-drawn as well as automobile. The U. S. Geological Survey reports that during August the output of the bituminous mines could have been increased 11% had the railroads been able to handle it.

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MEASURING CONCRETE WATER.

During the past few months prominence has been given to a number of tests, investigations and technical discussions, all going to prove the importance of regulating the quantity of water used in mixing concrete. These all seem to indicate that as the amount of water exceeds a certain limit, the strength of the concrete decreases to a very appreciable extent, and may even become almost negligible if the concrete be drowned with water. One writer a few months ago even claimed that, given the proper proportion of water and cement, the aggregate could be varied within quite wide limits without greatly effecting the strength of the mixture. It would be natural if, in the enthusiasm over this matter, investigators and writers should attach an importance to it greater than is really warranted; but there apparently can be no question that the amount of water used in concrete is a very important feature in securing strength, water-proofness and even durability, and there also can be little doubt that much more consideration should be paid to this feature of concrete mixing than is given to it in most cases.

If only a part of the claims made are justified, as much attention should be paid to securing the correct amount of water in a concrete mixture as is now paid to the measuring of the aggregates and the cement. It is true that different kinds of aggregate and different proportions require different amount of water to secure the most effective consistency; but the same is true of determining the amount of cement which will give the best results with the greatest economy. It should be a comparatively simple matter for an engineer to determine, from actual tests with the aggregate to be used, what consistency of concrete would best meet the requirements of strength and workability of the resulting mixture.

As to the actual measurement of the water, this would be a very simple matter. The pipe which supplies water to the mixer could be so located that a meter connected to it would be in view of the operator. If there were a demand for such a meter, the manufacturers could readily turn out one which would measure to the fraction of a gallon or cubic foot, or to the pound, with an accuracy fully as great as that now obtained in measuring the aggregate. Or a tank could be placed above the mixer, connection with the water supply being regulated by a ball float and cock which could be so adjusted as to allow the tank to fill to any desired point, this being regulated by the engineer at the beginning of each contract so as to fix definitely the amount that would be discharged into each batch.

If engineers are to take advantage of the opportunities offered by these discoveries for improving the quality of concrete, it certainly seems necessary to take immediate steps for actually measuring the water used in concrete mixing, and also for developing practical methods applicable by any engineer for deciding upon the amount to be specified for each particular kind of aggregate and proportion of mix.

SCRAPS OF PAPER.

Paper is one of the cheapest things we use, and we use about six million tons a year—more than 100 pounds for every man, woman and child in the country. As a result a great deal is wasted, since the saving that the ordinary citizen or family could make would mean so little in dollars and cents.

But saving paper now becomes a patriotic duty; and this includes not only cutting out unnecessary use, but seeing that paper that has served its purpose is saved to be used over again. In France our army engineers are using the backs of envelopes for making their calculations. How far we are from even approaching the economy!

Waste paper is used in various ways. Paper boxes, cartons and other containers are made of it, wrapping paper, twine, etc. The Ordnance and Quartermaster's departments use these in enormous quantities for supplies sent to the army; they are taking practically the entire output of plaster-board mills for constructing camps and hospitals; they are using index cards by the millon for registering drafted men, and the Quartermaster's Division has contracted for all the lightweight toilet tissue that all the mills can turn out within the next sixty days. Paper bandages and absorbent packs are rapidly taking the place of cotton, and it is also used for making gas masks. The higher grades of waste paper are used for making book and stationery paper. Saving and reusing waste paper therefore reduces the amount of new paper that must be manufactured.

And manufacturing new paper means reducing our supply of coal (one to three pounds for each pound of paper), sulphur, chlorine (the Government may require that the manufacturers dispense entirely with its use for bleaching paper), caustic soda and other chemicals, all of which are needed to the limit of availability in carrying out our war program.

Municipalities can be of the greatest help in recovering waste paper. Undoubtedly all citizens will gladly do their share by saving the waste paper in their households and places of business, if only they know what to do with the accumulations. In the large cities there are regular collectors of paper, that from the residences being removed in many cases by the Salvation Army. Let every municipality, large or small, see to it that some agency is provided for collecting waste paper from all its citizens, and that they are encouraged to save it. If necessary, let the municipality itself collect the paper, bale it, and arrange to forward it to the Salvation Army or other agent in the nearest city where one can be found.

This is one practical way in which every municipality can help win the war.

TOLEDO WATER DEPARTMENT IMPROVES GROUNDS.

Toledo, Ohio, draws its water supply from the Maumee river, filtering it through 34 rapid sand filters. The water works is operated by the Department of Public Service. A few years ago it was realized that the buildings and equipment needed a complete overhauling, and this was started in 1916. All the filters have been overhauled and modern equipment supplied, this part of the work having been completed in February of this year, although part of the building construction connected with the new chemical feeding apparatus is still not quite completed.

In describing these improvements in a recent issue of the Toledo City Journal (the official publication of the Commission of Publicity and Efficiency), R. W. Furman, the chemist in charge, gives the following description of the improvement of the grounds and buildings:

"Together with improvements for bettering the equipment and the quality of the water came the desire to place the grounds and buildings in as sanitary shape as possible in keeping with a utility of this kind. With this end in view the Service Department started the exterior and interior decorations as early as the fall of 1916. The services of a competent landscape architect were secured and the grounds were systematically converted into what will become one of the most beautiful parks in the city.

"Trees and shrubs of many varieties have been planted in an artistic and pleasing manner, together with scattered clusters of flowering plants and neatly trimmed rows of hedge. The lawns have been leveled and replanted and provisions have been made for winding pathways among the trees, although this matter has not been fully completed.

"The interior decorations consist chiefly of pressed metal ceilings to replace the old metal-lath and plaster used before. Examination of these plaster ceilings had disclosed the fact that repairs were out of the question and that this type of ceiling is not the most desirable on account of the dirt caused by falling plaster particles. Together with this work came the repair of walls and partitions that had been removed during previous construction work. The painting of the foyer, filter room, and laboratories was done by contract and this portion of the work was completed in the spring of 1917. In all of the remaining portions of the building this work has been done by the department's regular painter.

"The greater part of the equipment, pipe lines, and machinery has been repaired and painted in pleasing colors. The work connected with the interior decoration of the filter plant will be completed by the end of the present year. At present all of the inside painting has been finished but the chemical mixing rooms, the pipe gallery, and lower tunnel, the completion of this work depending on construction and repairs now not quite completed."

This is a further illustration of the tendency to render attractive waterworks buildings and other public properties and the grounds around them which seems to us so commendable and concerning which we have published several editorials and descriptive articles recently.

REVISION OF NATIONAL ELECTRICAL SAFETY CODE.

The Bureau of Standards of the Department of Commerce has asked that publicity be given to the following announcement:

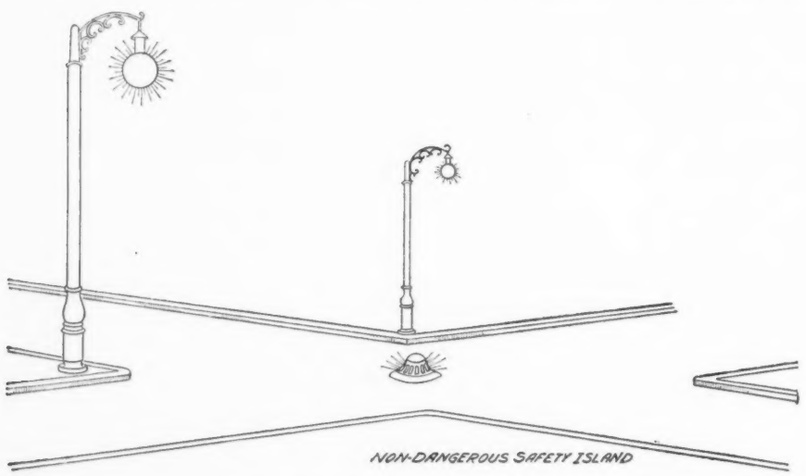
The present edition of the National Electrical Safety Code designated as Circular No. 54 of the Bureau of Standards has been exhausted and before reprinting, the text of the rules will be revised. This revision is now under way and the Bureau of Standards is anxious to secure from all interested parties comments and suggestions for change of or for additions to the present rules which will improve them. Changes to be adopted must be such as will reduce accident hazards and must be reasonable and practicable. They should be supported by citation of specific instances or other evidence when possible, and should be addressed to the Bureau of Standards, Washington, D. C.

A list of proposed changes to Part 3 of the Safety Code has already been prepared and copies have been sent to the committees of technical and utility associations, state commissions and others who have been co-operating with the Bureau in the formulation and revision of the rules. Similar lists of proposals for the other parts of the code are now being prepared.

A "SAFETY ISLAND" THAT IS NOT ONE.

A few weeks ago we published an article about "safety islands" that were not safe. This is about a "safety island" that is not one.

Possibly because of the prominence given to our article setting forth the danger to automobiles existing in the majority of safety islands, an engineer of the Bureau of Mines has evolved a device that is shown in the accompanying illustration. The director of the bureau was so pleased with it that he has sent blue-prints and descriptions of it to the principal cities of the country. Why the Bureau of Mines should go to this expense and trouble to advocate something so entirely outside its field is not apparent.



A MUNICIPAL DEVICE RECOMMENDED BY THE BUREAU OF MINES.

As a matter of fact, this device is not a safety island at all. It offers no protection for pedestrians crossing the street. The only purpose it serves, so far as we can see, is to mark the center of a street intersection, as a substitute for the iron standards sometimes called "silent policemen." But to our mind it is not nearly so effective as these and is much more expensive. It consists of a casting, "not over twelve inches high," containing an electric light in a red bulb, which light shines through slots in the casting. There is no opportunity for displaying the sign "Keep to the right" or any other instruction to traffic. During the day it would be little more conspicuous than a manhole cover, and at any time would be concealed from view by traffic that is at all dense.

The WEEK'S NEWS

County and State Highway Construction in Pennsylvania—Government Helps in Fight Against Spread of Influenza—Infantile Paralysis in Pennsylvania—St. Louis Water Works Men Strike—Water Power Bill Passes House—Firemen Strike in Lafayette, Ind.—Policemen Strike in Cincinnati—Housing Projects of U. S. Labor Board—Dutch Municipalities Combine to Buy Building Materials—Birmingham to Have Municipal Coal Yard—Omaha's Municipal Ice Plant in Operation.

ROADS AND PAVEMENTS

Mine Cave Causes Pavement Collapse.

Scranton, Pa.—Following a series of caves during the past four years in the Green Ridge section of this city, which resulted in wrecked houses and damaged property, a large section of pavement has given way. The cause is the extraction of coal under the area, leaving the surface unsupported. Boulevard avenue, a thirty-foot asphalt thoroughfare, has settled between seven and eight feet over a considerable area. A six-inch water main was broken in several places and numerous gas breaks occurred. A twenty-inch main that runs along the avenue on the river side of the street, between Scranton and Olyphant, was fortunately not broken. Had it broken it would have probably swept away several homes situated on filled-in ground in the neighborhood of the cave. This big main, in order to be safeguarded, will in all probability be suspended on heavy chains so that future settling will not carry it with the subsidence. Beginning last spring and about two months ago the Boulevard avenue pavement began to buckle in half a dozen places. The pavement, only laid a few years ago at heavy cost to the property owners, is ruined. Many feet of concrete and steel curb are broken, the steel edges sticking up in a dangerous manner.

Co-operation in Pennsylvania Highway Construction.

Harrisburg, Pa.—State Highway Commissioner J. Denny O'Neil has issued a statement showing the number of miles of new road construction and improvement now under contract and the counties in which the various projects are located. According to the statement, there are sixty-nine projects for road improvement under contract, located in thirty-three counties, the amount of money covering the contracts totaling $5,407,678.77. The mileage totals 150.52. That the department has been highly successful in securing local co-operation in the financing of the cost is indicated by the amounts contributed by local authorities throughtout the state. Federal-aid funds to the amount of $567,360 will also be applied towards the payment of these contracts. The figures show that local contributions plus the federal money total $2,356,929.01, which amount deducted from the total amount—$5,407,678.77—makes the net cost to the state for this road improvement $3,050,749.76. The type construction are reinforced and plain concrete, brick, waterbound macadam, bituminous concrete, asphaltic block, bituminous macadam, and a few projects for grading and drainage. The counties are: Armstrong, Allegheny, Beaver, Butler, Blair, Chester, Centre, Clarion, Clearfield, Crawford, Cambria, Clinton, Delaware, Erie, Fayette, Greene, Huntington, Lawrence, Lehigh, Lycoming, Lackawanna, Luzerne, McKean, Montgomery, Northampton, Somerset, Susquehanna, Venango, Warren, Washington, Westmoreland, York and Tioga. According to the statement the local contributions are distributed as follows:

Amount from local authorities on the "fifty-fifty" basis of improving state highway routes	$1,599,152.81
Voluntary contributions from local sources	116,372.48
Amounts paid on the state-aid basis from counties, townships, etc.	74,043.72
Total amount from local sources	$1,789,569.01
Federal-aid amount	567,360.00
Total amount (local funds and federal aid)	$2,356,929.00

After deducting the amount of money received from local and federal sources, from the total contract amount—$5,407,678.77—the net cost to the State is $3,050,749.76. The total mileage involved in the sixty-nine contracts is 150.52, and the types of construction are divided as follows:

Reinforced and plain concrete	42
Brick on concrete base	17
Water-bound macadam	2
Bituminous macadam	1
Bituminous concrete	2
Asphaltic block	1
Grading and drainage only	4
Total	69

Practically all of the above projects are main links in the state highway system and many connect county seats and important industrial centers. Some are important sections of the Lincoln Highway, the National Pike, the Pittsburgh Pike, and the sections of road in Erie County eventually will aid in linking up the road systems of Ohio, Pennsylvania and New York. While the state highway department deems all of these roads important, it is working in the fullest harmony with the Government, and schedules of all of the above projects have been submitted to the authorities at Washington for their consideration. In case they should deem it wise to suspend operations on account of the war, all of the above roads will be placed in the best possible condition, so that they can be used during the interim. The subject of maintenance is one that the Government, as well as the state highway department, will give careful consideration, as it would be false economy to allow the roads that already have been constructed to deteriorate. In order to expedite transportation, the state highway department will utilize local materials wherever available, and will do all maintenance work with regular help.

SEWERAGE AND SANITATION

Fight Spread of Influenza.

Washington, D. C.—Surgeon-General Blue of the United States Public Health Service has made a telegraphic survey to determine the extent of Spanish influenza in the country. General Blue found that there was a sharp outbreak at Fort Morgan, near Mobile, Ala., in August, and a about the same time a tramp steamer arrived at Newport News with almost the entire crew prostrated. Philadelphia posted a few cases some four weeks ago, and a few have been reported from New York. The Boston outbreak was reported on September 11. Since then the epidemic has appeared at New London and New Orleans.

"The disease is characterized by sudden onset," said Dr. Blue. "People are stricken on the street, while at work in factories, shipyards, offices or elsewhere. First there is a chill, then fever, with temperature from 101 to 103; headache, backache, reddening and running of the eyes, pains and aches all over the body and general prostration. Persons so attacked should go to their homes at once, get to bed without delay, and immediately call a physician.

"Treatment under direction of the physician is simple, but important, consisting principally of rest in bed, fresh air, abundant food, with Dover's powder for the relief of pain. Every case with fever should be regarded as serious, and kept in bed at least until temperature becomes normal.

"Convalescence requires careful management to avoid serious complications, such as bronchial pneumonia, which not infrequently may have fatal termination. During the

present outbreak in foreign countries the salts of quinine and aspirin have been most generally used during the acute attack, the aspirin apparently with much success in the relief of symptoms."

Because the last pandemic of influenza occurred more than twenty-five years ago physicians who began to practice medicine since 1892 have not had personal experience in handling a situation now spreading through a considerable part of the foreign world and already appearing to some extent in the United States. For that reason Dr. Blue is issuing a special bulletin for all medical men who send for it. In order to reach physicians and health officials of the country without delay, however, Dr. Blue has issued the following summary of methods for control of the disease:

"Infectious agent—The bacillus influenza of Pfeiffer.
"Sources of Infection—The secretions from the nose, throat and respiratory passages of cases or of carriers.
"Incubation Period—One to four days; generally two.
"Mode of Transmission—By direct contact or indirect contact through the use of handkerchiefs, common towels, cups, mess gear, or other objects contaminated with fresh secretions. Droplet infection plays an important part.
"Period of Communication—As long as the person harbors the causative organism in the respiratory tract.
"Methods of Control—(a) The infected individual and his environment.
"Recognition of the Disease—By clinical manifestations and bacteriological findings.
"Isolation—Bed isolation of infected individuals during the course of the disease. Screens between beds are to be recommended.
"Immunization — Vaccines are used with only partial success.
"Quarantine—None; impracticable.
"Concurrent Disinfection—The discharges from the mouth, throat, nose and other respiratory passages.
"Terminal Disinfection—Thorough cleansing, airing and sunning. The causative organism is short-lived outside the host.
"(b) General Measures—The attendant of the case should wear a gauze mask. During epidemics persons should avoid crowded assemblages, street cars and the like. Education as regards the danger of promiscuous coughing and spitting. Patients, because of the tendency to the development of broncho-pneumonia, should be treated in well ventilated, warm rooms."

"The present outbreak of influenza may be controlled to more or less extent by intelligent action on the part of the public. There is no such thing as an effective quarantine in the case of pandemic influenza," Dr. Blue adds, "but precautionary measures may be taken and should be taken. Thus far we have little information as to susceptibility of children, but it is fair to assume that this type of influenza might spread through a school as easily and rapidly as measles, for example."

New York, N. Y.—Ways of instructing the public how to prevent the spread of influenza from cases that might come to the city were discussed at a conference by health commissioner Copeland, Dr. Louis I. Harris, director of the bureau of preventable diseases in the health department, and other officials of the department and the United States Public Health Service. The conference was held after the health department had received reports that there were 8,000 cases of influenza among the soldiers at Camp Devens, at Ayer, Mass., with about 100 cases in the naval hospital at the submarine base in New London and others in Camp Lee, Va. Only twenty-three cases of influenza had been reported to the health department here, commissioner Copeland said, and all had been isolated, so that there was no danger of the disease spreading from them. All the cases were sailors from the American navy, who contracted the illness on ships as the result of heavy colds, Dr. Copeland said, and all were mild except two that had developed pneumonia. "There is no danger of the affection spreading here from the cases we have under treatment now," said commissioner Copeland, "and the health department, the Public Health Service and the navy surgeons are co-operating to see that no new cases are introduced. A rigid examination of the crews of all ships is being made at Quarantine and the navy yard."

Boston, Mass.—Naval officials have announced that 1,100 cases of grip had been reported among the men of the First Naval District between August 28 and September 10. Thirty-six of these cases developed into pneumonia, and twenty men died. Following this official announcement several hundred new cases have been reported, death being reported in 16 in the greater city, 10 among the naval men. Every effort was being made by naval physicians, the officials said, to stop the spread of the disease, and the measures were apparently meeting with success. The Naval Radio School at Cambridge was placed under quarantine and all instruction was suspended. Commanding officer Nathaniel F. Ayers said a number of the men had heavy colds, such as had been expected with the first change in temperature from summer to fall weather. Reports that the disease prevalent among the naval men was Spanish influenza was denied at the headquarters of the First Naval District.

Brookline, Mass.—Nearly one hundred sailors of the merchant marine suffering from grip, who have been stationed aboard training vessels in Boston harbor, were removed for treatment to tents pitched on the summit of Corey Hill, which forms part of the grounds of Brooks Hospital. Strenuous efforts are being made to prevent the further spread of the disease. Many cases have been reported from men in the navy stationed in this vicinity.

Newport, R. I.—The recent order of rear-admiral Joseph W. Oman, commandant of the Second Naval District, forbidding enlisted men to visit Boston on account of the prevalence of influenza in that city, was extended to prohibit the men from going outside of Newport without obtaining special leave. The order affects naval guards and yeomen. There are a few cases of influenza at the naval hospital here. Conditions are improving.

Yaphank, N. Y.—By order of the post commander, Colonel John S. Mallory, Camp Upton has been closed for an indefinite period on account of the accumulation there of so-called Spanish influenza cases. At this time 170 cases were reported from the base hospital at the camp. The muster at Upton was between 40,000 and 45,000 officers and men. There are sufficient physicians and nurses, and the situation is under control, but to avoid the spread of the disease beyond the camp confines Colonel Mallory decided that until further orders no visitors would be allowed to enter the camp and no one stationed there would be allowed to leave it except on the most urgent business. The source of the disease has not been traced. There have been no deaths; in fact, there are not even any very serious cases.

Urges Campaign Against Rats.

Washington, D. C.—The Council of National Defense has asked the State Councils of Defense to undertake a systematic campaign for the extermination of rats and mice. The necessity and importance of this campaign are shown by the statement of the council that according to careful investigation rats and mice consume annually food and property worth $200,000,000, or as much as it would take the labor of 200,000 men to produce. In addition to this they increase the fire risk and menace health.

Infantile Paralysis in Pennsylvania.

Harrisburg, Pa.—Infantile paralysis exists in eighteen counties of the state at the present time, according to reports received at the office of the state department of health, but in no place has it assumed alarming proportions with the exception of Franklin County. In other counties the disease exists merely as one or two cases and at very widely scattered points. Until a month ago Allegheny County had the largest number of cases, but at the present time there are twenty-six cases in Franklin County, fifteen of these being in the borough of Chambersburg. The board of health of Chambersburg has forbidden the opening of schools until the disease is under control, and has excluded all persons under the age of eighteen from all public gatherings. The county medical inspector, in co-operation with the local board of health, is investigating each case in the borough, and is likewise visiting each case reported in the rural districts. The Winchester, Va., health board has served notice on the Cumberland Valley Railroad that because of infantile paralysis no passengers from Franklin

County would be permitted to enter that city. An official order withdrew all tickets from there to Winchester from sale. From Knoxville, Fulton County, comes the report of the first case in that county.

WATER SUPPLY

Water Works Men Strike.

St. Louis, Mo.—Sixty laborers in the distribution department of the water department went on strike when their demands for higher wages were refused by commissioner Wall. Patrick Sullivan, delegate for the Plumbers' Helpers' Union, had asked that assistant section men now receiving $75 per month be given $100, and regular section men getting $85 per month be given $110. Their duties are to inspect and repair water mains and fire plugs. Commissioner Wall offered an increase of $10 a month. A break in a water main, while the men strike would probably result in sections of the city being without water.

Shipping Board Orders Water Conservation.

Oakland, Cal.—State officials of the United States Shipping Board have issued an order forbidding the sprinkling of lawns and gardens, and calling for general conservation of water in Oakland, Alameda and Berkeley. These communities are served by the East Bay Water Co., which has recently had to meet the demand for 6,000,000 gallons of water more daily for use of shipyards and other war industries. The conservation order is expected to reduce consumption from 22,000,000 to 17,000,000 gallons daily. If this is found to be an inadequate reduction, a water ration of 15 gallons per person per day may be put into effect. Water storage in Lake Chabot, the company's main source of supply, is far below normal this season. The lake is now 40 feet below the usual water level and the company has had to resort to well supplies. It was expected that new wells would be in service by September 1, which would furnish 4,000,000 gallons more. It was planned then to cut off the Lake Chabot supply for a week in order to remedy the present muddy condition of the water, caused by pumping from the low levels. When the lake is cleared, and with the new well supply and the savings ordered, the situation will be relieved somewhat. However, no material improvement in the general situation is expected by the company until the winter rains come. Meanwhile water is being boiled by orders of city physician Kirby Smith. The city is conducting rate litigation before the state railroad commission. The county farmers are asking the city to provide for a new supply for irrigation.

STREET LIGHTING AND POWER

Water Power Legislation Passes House.

Washington, D. C.—After several days of debate the "administration" water-power bill has been finally passed by the House. A second effort of leaders to so amend the bill as to provide in the recapture clause that the government when taking over properties shall pay only the "fair value" instead of the "net investment" failed. During consideration of the bill by a vote of 96 to 71, the House rejected an amendment that would have struck from the bill a provision which would compel full payment of the total "net investment" in any of the power projects before these projects could be taken over by the government. The vote was taken in committee of the whole. President Wilson had personally requested that the "fair value" clause be substituted for "net investment." Amendments following this suggestion were offered by representative Ferris of Oklahoma. The "net investment recapture clause" now in the bill provides that, as a condition precedent to taking over of any power project by the government, there must be paid the actual, legitimate cost of the project to the water-power developers. In opposing this proposition Mr. Ferris contended that it meant nothing short of having Congress "fifty years in advance commit the federal government to pay not what the property is actually worth at the time of retaking, but to pay what the water-power developers actually paid for the property at the beginning of the license period, plus the cost of extensions, improvements, etc., regardless of their condition when recaptured by the government." Chairman Sims and Mr. Ferris, in urging adoption of the fair valuation clause, based their argument on the ground that the net investment feature would make recapture so onerous that private interests would have a perpetual franchise. Mr. Ferris said the latter plan excluded the right of public ownership. In the debate representative Sinnett of Oregon criticised what he termed presidential interference with legislation. In considering the water-power measure Mr. Sinnett said the President "was not in possession of the exact facts." The House went on record as favoring the fifty-year lease period with the government or any municipality having the right to take over power projects at the expiration of the leasing period upon payment of the net investment. An amendment by representative Doremus of Michigan, giving the government the right to take over the projects at any time, was voted down.

State Board Opposes Federal Telephone Order.

Columbus, O.—Contending that telephone installation charges ordered by postmaster-general Burleson are excessive so far as Ohio is concerned, the state public utilities commission has refused to approve them, taking thereby what appears to be an attitude of open rebellion against the federal telephone administration. Burleson ordered companies to charge "readiness to serve" and installation fees on all new telephones at the rate of $5 on a phone costing $2 a month; $10 on $2 to $4 phones and $15 for phones over $4 a month. Ohio laws provide that telephone companies can collect charges only as set forth in schedules filed with the utilities commission. When the Ohio State Telephone Company attempted to charge the Burleson schedule the commission pronounced the charges excessive, and made its record show the schedule rejected. The commission's action was unanimous. Litigation to test the federal government's authority is looked for. "An installation charge of $5 to $15 in Ohio is outrageous, outlandish and positively wrong and inexcusable," declared C. C. Marshall, chairman of the commission. "Such a rate may be all right in New York for all I know, but Burleson can't shove it on us in Ohio without our protest. It may be Burleson has the power to force it through and that's what he'll have to do in this state. He can't collect it under Ohio laws. It may be he can under federal laws, but if so he'll have to fight for it. We fell right in line with the federal government on railroad rates because that looked fair to us, but they can't 'put over on us' such a thing as these telephone charges without a fight."

War Needs of Natural Gas in California.

Los Angeles, Cal.—A thorough investigation into the natural gas situation in Los Angeles and Southern California with a view to determining the amount of gas that may be diverted for use by war industries at Los Angeles harbor has been begun here by D. M. Folsom, federal fuel administrator for the Pacific Coast. The investigation will be conducted jointly under the direction of the state railroad commission and the Federal Fuel Administration. "I find that there will not be enough natural gas to supply our war industries and at the same time place Los Angeles consumers on a natural gas basis this winter," Mr. Folsom said. "But my investigations have convinced me that, by the use of both natural gas and mixed gas, there is no danger of a gas shortage in Southern California during the next eight or nine months. The Standard Oil Company has facilities available for furnishing 51,000,000 feet of natural gas daily, and when new equipment now being installed is completed the company will increase its present output by about 60 per cent. Two new gas lines, one a four-inch pipe and another pipe eight inches in size, are being laid from the gas fields to the shipyards at the Long Beach and Los Angeles harbors to supply gas for use by the shipbuilding companies and for domestic use by the ship workers. Los Angeles consumers are receiving the best gas of any city

in the United States. The gas supplied Los Angeles has 800 heat units, while the gas of other cities averages about 528 heat units. Natural gas has 1,100 heat units. Thus it can be seen how necessary it is that this gas should be diverted to industrial establishments engaged in war work." Mr. Folsom said there is no shortage of fuel oil in California at the present time; neither is there a shortage in gasoline.

FIRE AND POLICE

Big Fire Sweeps Shipyard.

Camden, N. J.—Four plate and angle shops at the New York Shipbuilding plant here, valued at $500,000, were destroyed by fire. Steel and iron parts for torpedo-boat destroyers were being made in the shops. Officials of the shipbuilding company declared the blaze started accidentally near a forge. All the shops destroyed were in the lower part of the main yard. The blaze spread quickly, the timber in the shops, each about 1,000 feet long, being consumed rapidly. An inestimable number of destroyer parts were so damaged they will be useless. Every piece of fire-fighting apparatus in Camden was sent to the yards, as well as apparatus from Gloucester and suburbs. Fire companies from Philadelphia and a fire-boat also were on the scene. Ten destroyer ways are near the scene of the fire, and on five of these boats are in course of construction. No material loss occurred here.

Firemen on Strike.

Lafayette, Ind.—Nineteen of the twenty-eight members of the Lafayette fire department have gone on strike. The men demanded an increase of $20 a month. New men are being appointed to fill their places.

Firemen Call Off Strike.

Des Moines, Ia.—The firemen have called off their wage strike for thirty days following a promise from the council to raise their pay $25 a month, effective September 1. Men now getting $85 will get $110 monthly, and those getting $100 will get $125. Action on the firemen's wages will be taken as soon as the present bond issue tangle is straightened out.

Fire Prevention Inspection of War Work Plants.

Washington, D. C.—The work of inspection of the Fire Prevention Section of the War Industries Board from April 5, date of organization, to September 3 covered 1,469 munition plants, each having from one to fifty buildings devoted to government contracts. As a result of the survey the section, of which W. H. Merrill is the head, rated the plants as follows: Good (or no action required), 1,142; fair, 136; poor, 118; bad, 73. Improvement work is reported completed in 152 plants where changes were recommended, and 279 plants are reported to have work under way. The section is now conducting a survey of fire-prevention conditions at ports on the Atlantic seaboard and the Great Lakes at the request of attorney-general Gregory.

Three-Day Strike of Policemen.

Cincinnati, O.—Following a three-day strike the policemen of the city have returned to their beats. For four hours at the beginning of the strike the city was guarded by only forty-eight policemen, the second shift, which reports at 3 p. m., failing to put in an appearance. At 7 p. m., however, 600 members of the home guard, under the command of Colonel Charles F. Hake, took charge. For several months the policemen have been complaining that they were underpaid considering the high cost of living, and numerous requests for increases had been made. No intimation that a strike was impending was given until the morning of the strike, when it was learned by chief of police Copelan that the policemen were holding a secret meeting. He sent three detectives to the scene of the meeting, but these were denied admission. Half an hour later a demand was presented to safety director Holmes for an increase from $1,260 to $1,500. A note accompanying the demand stated that unless it was met by 3 p. m. a strike would be declared. The safety director did not answer, and accordingly the second shift men failed to report. After three days the men decided to go back. No concessions or promises were made to them.

CITY PLANNING AND HOUSING

New Housing Projects Announced.

Washington, D. C.—The Bureau of Industrial Housing and Transportation of the Department of Labor announces the following appointments in connection with projected housing developments:

Bureau of Standards, Washington, D. C.: Architect, Donn & Deming, 88 Seventeenth street N. W., Washington, D. C.

Dayton, Ohio: Architect, Schenck & Williams, 908 Mutual Home building, Dayton, Ohio; town planner, F. Vitale, 527 Fifth avenue, New York City.

Eddystone, Pa.: Architect, Rankin, Kellogg & Crane, 1012 Walnut street, Philadelphia, Pa.; town planner, John Nolen, Harvard square, Cambridge, Mass.; engineer, Charles F. Mebus, 907 Land Title building, Philadelphia, Pa.

Elizabeth, N. J.: Architect, Charles W. Oakley & Hugh Roberts, Associated, 1259 Clinton place, Elizabeth, N. J.; town planner, A. F. Brinkerhoff, 527 Fifth avenue, New York City; engineer, C. D. Pollock, Park Row building, New York City.

Pensacola, Fla: Architect, Favrot & Livaudais, Title Guaranty building, New Orleans, La.; town planner, Favrot & Livaudais, Title Guaranty building, New Orleans, La.; engineer, Arthur Pew, Forsyth building, Atlanta, Ga.

New Orleans, La.: Architect, Favrot & Livaudais, Title Guaranty building, New Orleans, La.; town planner, Favrot & Livaudais, Title Guaranty building, New Orleans, La.; engineer, J. W. Billingsley, Interstate Bank building, New Orleans, La.

Watervliet (Troy), N. Y.: Architect, Stanton P. Lee, 55 Third street, Troy, N. Y.; engineer, P. E. Green, engineering staff.

Contracts Let for Two Housing Projects.

Quincy, Mass.—The Bureau of Industrial Housing and Transportation of the Department of Labor announces that the Casper Ranger Construction Co., of Holyoke, Mass., has been awarded the contract for the construction of 256 houses providing accommodations for 422 families at Quincy, Mass. This project is to care for employees of the Fore River Shipbuilding Co., and is expected to materially relieve the congestion which has been occasioned in that community by reason of a shortage of satisfactory housing facilities.

Watertown, N. Y.—The Department of Labor announces that a contract for 300 houses, utilities and town planning at Project No. 389, located here, has been awarded to Edward F. Fenno, 204 North Beech Street, Syracuse, N. Y. The contract is on a fixed fee basis; he estimated cost is $1,504,474.

Housing Conditions Considered in Government Contracts.

Washington, D. C.—According to an important statement by the War Department, "Housing and transportation conditions have become so congested in some 60 towns and cities where war supplies are being manufactured that it has become necessary for the General Staff to advise all of the supply bureaus of the War Department to give careful consideration to local conditions before placing contracts. In each of the 60 towns it has been found necessary for the Bureau of Industrial Housing of the Labor Department to make provision to expend appropriations in order to relieve shortage of housing and transportation. The Bureau of Industrial Housing has a large amount of data which indicate great expansion in industries in the cities and towns mentioned. At the present time it is found that the extreme congestion of living conditions is so great that the use of beds three shifts a day have become imperative. This condition has created an exceedingly high labor turnover, which has made for increased cost and delay in the completion of work. It is appreciated that War Department contracts may have to be expanded at these points, in spite of the known congestion, but the bureaus are advised that it should be done only after the most careful consideration. The bureaus are warned that the funds at the disposal of the Labor Department for providing housing to meet the increased demands are limited, and it is desired to avoid such expenditures wherever possible. The General Staff will see to it that the placing of contracts in these towns

is reduced to the minimum, and has especially instructed the Quartermaster Corps to avoid these points because of the relative flexibility of their contracts. It is not the object to cut off new orders in the districts mentioned, but to regulate them. Where it is a question of new plants requiring additional power, additional labor, or the building of new structures, or the need of largely increased facilities, the disposition of the General Staff is to discourage such increases and to develop such new industries outside of the districts mentioned. This is in keeping with the program of the War Industries Board, the plan being to continue using present facilities and labor supply to the maximum." The congested districts where the housing shortage is so serious as to require Federal expenditures for new housing are reported in the following places:

Aberdeen, Md.; Alliance, Ohio; Alton, Ill.; Bath, Me.; Bayonne, N. J.; Bethlehem, Pa,; Bridgeport, Conn.; Butler, Pa.; Camden, N. J.; Charleston, S. C.; Charleston, W. Va.; Chester, Pa.; Davenport, Iowa; Dayton, Ohio; Derby, Conn.; Easton, Pa.; Eddystone, Pa.; Elizabeth, N. J.; Erie, Pa.; Florence, Ala.; Hammond, Ind.; Indiana Harbor, Ind.; Jersey City, N. J ; Gary, Ind.; East Chicago, Ill.; Lowell, Mass.; Middletown, Ohio; Milton, Pa.; Moline, Ill.; Newark, N. J.; New Brunswick, N. J.; New Castle, Del.; New London, Conn.; New Orleans, La.; Newport, R. I.; Newport News, Va.; Niagara Falls, N. Y.; Niles, Ohio; Norfolk, Va.; Pensacola, Fla.; Perth Amboy, N. J.; South Amboy, N. J.; Philadelphia, Pa.; Phillipsburg, N. J.; Portsmouth, N. H.; Portsmouth, Va.; Puget Sound, Wash.; Quincy, Mass.; Rock Island, Ill.; Seattle, Wash.; Sharon, Pa.; Sheffield, Ala.; Mariners Harbor, Staten Island, N. Y.; Tacony, Pa.; Troy, N. Y.; Utica, N. Y.; Warren, Ohio; Waterbury, Conn.; Watertown, Mass.; Watertown, N. Y.

Cities Form Company to Buy Building Materials.

The Hague, Holland.—A central company for purchasing building materials (Centrale Bouwmaterialenvoorziening C. B. V.) has now completed its organization by the election of officers and has established headquarters at Mauritskade 33, The Hague. The manager of the company, H. C. A. Henny, says: "The municipalities of The Hague, Amsterdam, and Utrecht, in conjunction with the Ministry of Waterstaat, which has charge of all public parks of the state, were the originators of the company, but later more than 100 Dutch municipalities joined in this enterprise. The object of the company is to supply the different municipalities with as cheap building material as can be bought by buying in large quantities, but no private person can make use of the company. In other words, our aim is to assist municipalities only, in erecting buildings needed for their population. Frankly, I hardly think we shall be able to buy much from the United States, at least not to start with, under present circumstances; but even after the war I think high freight rates will make it impossible for the United States to compete with northern Europe and Germany. Our paving material we get from Sweden and Belgium, and for roofing we shall use our good old Dutch tiles. However, I believe we shall look to the United States for bathroom fixtures, etc., if it is possible to import these from there at reasonable figures. At the same time I wish to say that offers from the United States for all sorts of building materials will of course be welcome and will always be given a candid consideration."

MISCELLANEOUS

From Coal Mine to Municipal Yard by Truck.

Birmingham, Ala.—Coal will be hauled to Birmingham from the Cahaba coal fields by trucks within the next month, according to an official announcement. The hauling of coal direct from mine to consumer will be on what is claimed to be the most extensive scale ever attempted in the United States. Not less than 200 tons of coal will be brought to Birmingham a day by two fleets of motor trucks to be owned and operated by the Perkins Motor company. The arrangements for hauling this coal is the result of two months' work by a committee from the civic association, with judge Hugh A. Locke as chairman, the city commission and the county board of revenue. The project was undertaken to relieve the possibility of a recurrence of a serious coal shortage, such as existed last winter, and is indorsed by the Jefferson county fuel committee. The municipal coal yard will be opened this year with the coal that is brought in by truck, according to commissioner J. Ellis Brown. Coal may be secured in small amounts from this yard by people who are unable to buy in large quantities, and a sufficient amount of coal to prevent actual suffering will be furnished to deserving cases after investigation. The details of this municipal coal yard will be announced later. A resolution has been passed by the board of revenue ordering the building of four miles of public highway known as the Pump House road, which will open up what is known as Blach's and McGeever's mines. Work on this road will be begun at once and rushed to completion, while the mine owners and operators will at once begin the construction of nearly two miles of economical roadbed, connecting the mines at a cost of several thousand dollars. The construction of these roads will give Birmingham a continuous stretch of low-grade macadamized and cherted roads from the mines direct to the consumers of this city. More than $30,000 will be invested at once by the Perkins Motor company for two fleets of trucks to be used exclusively for the hauling of coal, one fleet to haul coal from the Cahaba field on Red mountain and the other will transport coal from the Newcastle mine, which will have an output of approximately 100 tons per day, from Black Creek and Jagger seams. The supply of coal in Birmingham will be increased by about 50,000 tons in addition to what would normally come by rail, as a result of the motor transportation, and it is believed this will prevent any serious coal shortage in Birmingham. The committee pushing this matter of motor transportation will ask the aid of the fuel administration in developing other mines, while the board of revenue will be requested to improve all feasible roads by which coal may be hauled in trucks in the county. The co-operation of the railroads will be asked so more cars may be released for other traffic.

Municipal Ice Plant in Operation.

Omaha, Neb.—The new municipal ice plant is now in full operation and nine sales stations have been opened. Ice is being sold at these stations at the rate of 30 cents per 100 pounds and quantities will be sold as small as 16 pounds for five cents. After the municipal plant has been in operation for a while, the management will undertake to make wholesale deliveries in auto trucks, this rate probably to be the same as prevailing wholesale prices. The plant, when in full running order, will have a daily capacity of 100 tons. A large storage house is now under construction, with a capacity of 9,000 tons. The ice is made in tanks which are 60 feet long, six feet deep and 30 feet wide. In these large tanks a brine is circulated in sluice-like spaces to keep the brine temperature even. Into this brine 1,200 cans are lowered, each can having a wooden cover. The freezing process is caused by expansion of ammonia in the coils and lowering the temperature of the brine which in turn freezes the water in the cans. When the ice is ready, two cans are lifted out by an electric hoist which travels over to a truck. As the cans are emptied of ice they are immediately refilled with water, which has been softened. W. J. Barber is superintendent of the plant.

Michigan Cities May Operate Fuel Yards.

Lansing, Mich.—"Home-rule" cities in Michigan have the right to establish and operate municipal fuel yards, according to an opinion from the department of attorney general Alex J. Groesbeck to governor Albert E. Sleeper. The question was raised at Grand Rapids, where by initiatory petition, an amendment to the city charter is sought which would permit the city to sell wood, coal and other fuel to the people at cost. The opinion holds that under the power of home-rule cities, they have the right for the general welfare of the people to conduct such a business. In the brief filed with the papers, a Maine court's decision was given. This was to the effect that the court could see no difference from the law standpoint between furnishing heat by delivery through pipes under ground and distributing fuel in wagons or otherwise over the streets to the homes of consumers. It is the opinion of the legal department that such a business can be established by a vote of three fifths of the legislative body of a city operating under "home-rule."

NEWS OF THE SOCIETIES

Sept. 24-27.—INTERNATIONAL ASSOSOCIATION OF MUNICIPAL ELECTRICIANS. Annual convention, Atlanta, Ga. Secretary, Clarence R. George, Houston, Tex.

Sept. 25-26.—AMERICAN WATER WORKS ASSOCIATION, Central States Division. Annual convention, Pittsburgh, Pa. Secretary, R. F. Bricker, Shelby, O.

Oct. 2-4.—AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS. Annual meeting, Buffalo, N. Y. Secretary, Charles Carroll Brown, 304 E. Walnut St., Bloomington, Ill.

Oct. 7-9.—AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS. Annual meeting, Chicago, Ill. Acting secretary, A. D. Williams, Morgantown, W. Va.

Oct. 14-17.—AMERICAN PUBLIC HEALTH ASSOCIATION. Annual meeting, Boston, Mass. Secretary, 126 Massachusetts Ave., Boston, Mass.

Oct. 17-19.—KANSAS PUBLIC SERVICE ASSOCIATION. Annual convention, Kansas City, Kan. Secretary, W. W. Austin, Cottonwood Falls, Kan.

Nov. 6-8.—CITY MANAGERS' ASSOCIATION. Fifth annual convention, Roanoke, Va. Secretary, H. G. Otis, city manager, Auburn, Me.

Nov. 14-15.—WASHINGTON STATE GOOD ROADS ASSOCIATION. Annual convention, Pasco, Wash. Secretary, Clancey M. Lewis, Seattle, Wash.

Smoke Prevention Association.

The thirteenth annual convention of the Smoke Prevention Association was held recently at Newark, N. J. Several interesting and important papers relating to fuel conservation and smoke prevention were presented, while the various entertainment features as arranged by Daniel J. Maloney, Newark, city smoke inspector and first vice-president of the association, were enjoyed by the delegates and guests.

The opening session on Tuesday morning, Aug. 20, was called to order by William A. Pittsford, Kewanee, Ill., in the absence of president William H. Reid, of Chicago. This meeting was devoted to preparatory work in connection with the convention, including a reading of the minutes of the twelfth annual convention held a year ago at Columbus, O. In closing the brief session, Mr. Pittsford spoke i high terms of a book to be issued by the Smoke Department of the city of Newark, compiled by Mr. Maloney, giving valuable data and information on the subject of boiler installations and kindred apparatus, to assist in smoke elimination and coal conservation. This book, a volume of 78 pages, has been designed for general distribution, with purpose to assist the power-plant operative, power-plant owner, engineers and others. Completed copies of the booklet were given to the delegates before the close of the convention.

At the Tuesday afternoon session, Mayor Gillen, of Newark, welcomed the visitors on behalf of the city. The opening paper was by Newell W. Roberts, vice-president of the International Coal Products Corporation, New York, on the subject of "Carbocoal." This is a new fuel now being manufactured at Irvington, a section of Newark. This fuel, produced in briquet form from high volatile bituminous coal, is smokeless and, as developed, has all the essential properties of a perfect coal. Its success has attracted the Government, with the result that a large plant for the manufacture of carbocoal for navy and merchant-vessel service is now being erected at Clinchfield, Va. This plant will cost about $2,000,000 and is expected to be ready for operation in the early part of the coming year.

Frank W. Casler, superintendent of production, the Public Service Corporation, Newark, gave an interesting talk on "Burning a Million Tons of Coal a Year and How We Supervise It."

Papers were also presented at this session by A. H. Blackburn, chief engineer, Underfeed Stoker Company of America, Chicago, "Boiler Room Efficiency," and read in his absence by A. B. Curtis, Jr., of the same company; and "Smokeless Combustion with Chain-Grate Stokers," a closely kindred subject, by Thomas A. Marsh, chief engineer, the Green Engineering Company, East Chicago, Ind. A comprehensive discussion of this last paper followed its reading, joined in by J. G. Worker, of the Westinghouse Electric & Manufacturing Company, Pittsburgh; O. C. Woolson, boiler expert, Newark, N. J., William A. Pittsford and others.

In the evening a special motion-picture exhibit was given for the delegates and guests at a theat r roof garden, at which were shown, among other films, a picture produced by the Westinghouse Electric & Manufacturing Company, showing the value of the electrification of railroad lines, and a film of the Kewanee Boiler Company, Kewanee, Ill., illustrating the features of boiler installations to make for smoke abatement.

The only business session on Wednesday was held in the forenoon, and devoted to an illustrated address by William A. Pittsford, Kewanee Boiler Company on the subject of "Using Bituminous Coal for Boilers for Heating," covering, primarily, low-pressure boiler installations and proper character of settings to develop right combustion and smoke prevention.

Wednesday afternoon was given over to an automobile trip to the Newark watersheds at Pequannock and vicinity, a total distance of about 80 miles. At one of the stopping points, an informal address was made by Frank J. Foley, deputy commissioner of parks and public property.

Thursday, the last day of the convention, was designated as "Railroad Day," and devoted to papers and addresses of particular interest to those engaged in locomotive operation.

(*Continued on page* 240.)

PROBLEMS CITIES ARE STUDYING
WITH EXPERTS

A BRIDGE is to be built by Perry, Okla., according to plans prepared by the engineer, H. J. Wilkins.

STREET IMPROVEMENTS are to be made by Bellevue, Pa. The McBride Engineering Co. is preparing plans and specifications.

Oakdale, La., is to be build a SANITARY SEWER SYSTEM, the engineer, Xavier A. Kramer, preparing plans for the work.

A FILTRATION PLANT and water testing station are to be built by Midland, Mich. The consulting engineer for the improvement is Samuel A. Greeley.

A SEWAGE DISPOSAL PLANT to cost about $60,000 is to be built by New Brighton, Pa., according to plans prepared by the engineer, R. Winthrop Pratt.

The WATER DISTRIBUTION SYSTEM of Ardmore, Okla., is to be extended by the laying of 13 miles of new mains. Plans and specifications for the work were prepared by the consulting engineering firm of Mackintosh-Walton.

Westmont, N. J., is to make STREET IMPROVEMENTS. The consulting engineering firm of Remington & Vosbury is preparing plans for the work.

Crawford County, Van Buren, Ark., is to make LEVEE IMPROVEMENTS following the completion of plans for the work by the consulting engineering firm of Winters & Dove.

A VALUATION of the Bernardsville, N. J., WATERWORKS and plans for RECONSTRUCTION are to be made by the consulting engineer, Clyde Potts.

The WATERWORKS SYSTEM of Richmond, Mo., is to be improved by an addition to the filter plant and other work. The consulting engineering firm of Black & Veatch prepared plans and specifications.

Extensive WATERWORKS and SEWERAGE IMPROVEMENTS are to be made by Okmulgee, Okla., including pumping station, new mains, filtration plant, sewer extensions and sewage disposal plant. Plans and specifications for the work were prepared by the firm of Burns & McDonnell.

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

WHITE FIRE APPARATUS.

Makes New Pumping Record in Chicago.

One of the outstanding features of this year's convention of the International Association of Fire Engineers at Chicago was a continuous pumping test of sixty hours' duration by a White 16-valve triple combination pumping engine, chemical and hose car. The sixty-hour record is said to have exceeded by forty hours the best previous continuous run which has been authenticated. Phenomenal as was this feat, equivalent to a new world's record if not actually constituting one, it was marked by smooth running and absence of vibration.

Inasmuch as twenty hours formerly was considered a sufficient period of a non-stop pumping test, the motor engineers and fire specialists who conducted the test could have stopped when the twenty-hour point was reached, but it was felt that by a close study of the sixteen-valve motor and its application to fire duty they could learn more.

The test was made on the Chicago Municipal Pier, pumping from draft under the observation of members of the association. During the days and nights when the pumper was adding to the previous twenty-hour record, fire chiefs made trips from the convention to the pier in automobiles, motor buses and exhibition fire apparatus. Every minute after the twenty-hour record was passed, fire chiefs became more enthusiastic and many who had planned to leave Chicago during the early part of the convention remained to see the wonderful motor complete the task set for it.

Unstinted praise was heard from all sides, particularly when engineer E. R. Townsend of the Stock Fire Insurance companies and fire chief Faxon Billings of Quincy, Mass., completed their examination and inspection of the apparatus and announced it to be in satisfactory condition.

The power plant of this apparatus consists of 4-cylinders, cast en bloc, of high manganese, close grained iron, 16 valves, 70 horse power. The crank case is made in two sections of special aluminium alloy, the upper section carrying all the working parts of the motor, while the lower is simply an oil well and easily removed for inspection or adjustment. The crank shaft is of forged chrome nickel steel, counterbalanced, unusually heavy construction. The valves are mechanically operated and interchangeable. They are made of alloy steel to prevent distortion and pitting. The cam shafts and cams are a one-piece forging of case-hardened nickel steel.

Ignition is "Eiseman," waterproof dual type.

The carburetor is of White design, barrel type throttle, connected with hot air stove on exhaust pipe.

Motor cooling is by positive water circulation by gear driven centrifugal pump; "cellular" radiator and chain driven fan.

Lubrication is by full pressure system. There is direct feed to each of the main shaft bearings and cam shaft bearings. Each connecting rod bearing is also positively lubricated by means of oil ways drilled through the crank shaft. The oil pump is a gear pump driven by exhaust cam shaft.

Motor control is by throttle and spark advance, controlled by levers mounted on steering wheel; throttle is also operated by accelerator pedal. Starting the motor is facilitated by a compression release, which is operated by the foot, when the driver sits in the car and uses electric starter; or by means of a small lever at the front end of the frame in the case of cranking.

The clutch is single plate of special White design; it runs in oil and operates easily and smoothly. Transmission gives four speeds forward (direct drive on third speed) and one reverse. Transmission is of selective type. Gears are of special chrome nickel steel. Transmission with engine form a unit power plant. All gear shafts have annular ball bearings.

Steering gear is worm and sector type, irreversible, with ball and thrust bearings. There are two brakes, on each rear wheel, acting on wide drums of large diameter. Those operated by foot are asbestos lined, external, contracting; those operated by hand lever are internal, expanding, metal to metal. Drive is by shaft from transmission to rear axle. This shaft is fitted with two Universal joints, the rear one telescopic. The shaft is of chrome nickel steel, heat treated.

The frame is pressed, crucible, chrome-nickel steel, channel section side members. The springs are semi-elliptic front and rear. The front axle is one piece, forged I-beam section. The rear axle is a special White type. The gear case and right and left axle sleeves are supported by a heavy truss, from the end of the sleeves, under case. All gears are accessible through large cover on top of case. Axle shafts are of chrome-nickel steel. The wheels are artillery type, with unusually heavy hubs and spokes.

The hose body is strongly built of steel, hot riveted throughout. Full

WHITE TRIPLE COMBINATION MAKING 60-HOUR TEST RUN AT CHICAGO.

chemical equipment is provided, including tank, receptacles, hose basket, nozzles, extinguishers, etc. Fire accessories include extension and roof ladders, crowbar, axes, torches, door opener, nozzle plugs, lanterns, bell or gong and hand siren horn.

The body of Type B. rotary fire pump is of cast iron, ½-inch thick. It consists of an intake casting which forms the base of the pump, and outlet casting and front and rear end castings which house the bearings. The water cams or gears are of bronze. The teeth of the cams are fitted with bronze packing strips which are backed up by bronze springs. The object of these packing strips is to make close contact against the cast iron walls of the pump chamber without wearing out the cams themselves.

The pump shaft on which cams are mounted are supported on both sides of the pump by ball bearings. These bearings are outside of the water chamber although they are held in housings which are a part of the pump castings. On the back of the pump are two hardened cut steel pilot or driving gears, keyed to the shafts. These gears are housed in a cast iron case which also forms the housing for the rear bearings. This is oil tight, making it possible for the gears to be run in oil to minimize wear. The object of these gears is to prevent wear on the cams. It will be readily apparent that if one of the bronze cams drives the other cam there will be more or less wear on the contact surfaces of both cams. Wear on these surfaces means increasing slippage of water and consequent decreasing efficiency of the pump. Instead of having two bronze surfaces rubbing against each other lubricated only by water which is sure to contain mud and grit, the wearing surfaces are of hardened steel running in a bath of clean lubricating oil. The pump is driven through power transmission and trains of hardened steel gears running on ball bearings and roller bearings in an oil tight case, connected to pump by flexible coupling.

A hand lever controls application of engine power by turning it from the drive wheel to the pump mechanism which operates through the regular transmission gears, giving the cams four speeds forward and one reverse that are used in driving the car. There is a clutch pullout on the working side of the pump so that it may be run from the ground as well as from the seat. The stuffing boxes on the pump are easily accessible and are very compact. The parts of the shafts which come in contact with the packing are covered with the bronze bushings so that there will be no rust to roughen the shaft and increase the friction. By an ingenious and patented arrangement all water which leaks past the sides of the cams is by-passed back to the intake side of the pump and does not exert the pump pressure against the packing. Therefore as the packing need be drawn up only tight enough to overcome atmospheric and gravity pressure to prevent leakage, the friction between the packing and the shaft becomes negligible.

The pump is designed so that the suction hose may be attached to either side or both sides. Suction connection on each side fitted with removable strainer and caps with long handles. Outlet connection on each side fitted with White valves, caps and chains. On each side of the outlet chamber is provided a White 2½-inch brass gate valve arranged to be opened and closed quickly, with caps and chains. Adapters threaded to fit the fire hose to be used are fitted on the outside of these valves. A water line is run from the outlet side of the pump to the cooling system of the motor in order that cold water may be pumped through the motor water jackets at all times when the pump is being operated. If desired the chemical tank piping may be connected to the pump in such a way that water may be pumped through the chemical hose and may also be pumped into the chemical tank to recharge it.

Two gauges are provided on the pump, one is a pressure gauge 300 lbs. and the other is a compound pressure and vacuum gauge 150 lbs. pressure and 30 inch vacuum. Option of Larkin or Meyer automatic relief valves is given.

The accompanying illustration shows the equipment during the test. The apparatus is made by the White Company, Cleveland, O.

NEWS OF THE SOCIETIES

(*Continued from page* 219)

Thomas F. F. Lee, Woodhaven, L. I., gave an interesting talk on combustion, dealing for the most part with personal experiences and experiments and leading to the development of a new type of stoker, patents for which are about to be issued.

The different papers and addresses presented were: "Burning Pulverized Coal," by H. D. Savage, vice-president of the Locomotive Pulverized Fuel Company, New York, covering both locomotives and stationary power plants; "Mechanical Stoking of Locomotives," by W. S. Bartholomew, of the Locomotive Stoker Company, Pittsburgh; a talk by Robert Collett, New York, Conservation Department of the United States Fuel Administration, dealing with the importance of fuel conservation; and brief talks by C. D. Van Schaick, combustion expert, New York Central Lines, New York; J. H. Lewis, chief smoke inspector, Chicago, Burlington & Quincy Railroad, Chicago; and John B. Hurley, Wabash Railroad, Decatur, Ill.

At the conclusion of the session the annual election of officers was held, resulting in the appointment of the following for the ensuing year: President, Warren A. Edson, Boston; first vice-president, W. H. Corbett, Michigan City, Ind.; Second vice-president, William A. Pittsford, Kewanee, Ill.; and secretary-treasurer, Frank A. Chambers, Chicago, re-elected. Chicago was selected as the next convention city, with exact time of meeting to be decided at a later date; a resolution was adopted providing for the arrangement for an exhibit hall at the next annual meeting for the use of manufacturers of power-plant apparatus.

INDUSTRIAL NEWS

F. W. Meegan, resident engineer for **Luitwieler Pumping Engine Co.,** Rochester, N. Y., reports that it has been awarded a contract by the Garden City Co., N. Y., for well and deep-well pump to pump 600 gallons of water per minute from a point 85 feet below the surface directly into the mains against 60 pounds pressure. This water is to be used for additional supply to Camp Mills. This will require a pump with a 14-inch cylinder (probably the largest deep-well pump in the east) in a 20-inch well 100 feet deep, driven by a 50-h. p. motor. It is intended to have the pump installed by October 15.

Tire Economy Conference.

A Tire Economy Conference was held Sept. 15 to 17 in Chicago, at which were discussed a number of subjects of interest to truck users. All phases of economy in maintenance and operation were taken up. Government bureaus, state councils of defense, delivery departments of big establishments, and fire and police departments of all large cities were invited.

The American-La France Fire Engine Co., Inc., Elmira, N. Y., has recently received the following orders: Camden, N. J., type 14 comb. service truck; Clifton, N. J., type 40 pumping engine; Cumberland, Md., type 40 comb. with junior pump; Depue, Ill., type 75 comb. with junior pump; Eau Claire, Wis., type 75 pumping engine; Hastings, Neb., type 75 pumping engine; Jersey City, N. J., 3 type 12 pumping engine; Kearny, N. J., type 75 pumping engine; Kearny, N. J., type 14 comb. service truck; Lewiston Junction, Pa., type 40 comb. with junior pump; Marshall, Mich., type 40 comb. with junior pump; Minonk, Ill., type 40 comb. with junior pump; Peabody, Mass., type 75 pumping engine; Schenectady, N. Y., type 31 steamer tractor; Tacoma, Wash., 2 type 12 pumping engines; Tacoma, Wash., 4 type 12 pumping engines; Tacoma, Wash., 14 comb. service truck; U. S. Government, Edgewood, Md., 2 type 12 pumping engines; Manila, P. I., 3 type 40 combs. with junior pump; West Chester, Pa., type 75 pumping engine; Williston, N. D., type 40 comb. with junior pump.

ADVANCE CONTRACT NEWS

ADVANCE INFORMATION
BIDS ASKED FOR

CONTRACTS AWARDED
ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested t o send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
			STREETS AND ROADS.	
Ark.	Pocahontas	Sept. 22	Constructing 9.4 mi. macadam road	County Clerk
N. J.	Irvington	8 p.m., Sept. 23	Constructing concrete safety aisles	I. J. Casey, Jr., Town Engr.
N. Y.	New York	2 p.m., Sept. 23	Regulating and paving with second-hand granite block on sand foundation	Frank L. Dowling, Borough Pres. of Manhattan.
Tenn. and Va.	Bristol	Sept. 23	Grading and paving with 20,000 sq. yds. concrete and asphalt	City Recorder, Bristol, Tenn., and City Clk., Bristol, Va.
Tenn.	Bristol	Sept. 23	5,000 sq. yds. paving	City Recorder.
Va.	Bristol	Sept. 23	6,000 sq. yds. paving	City Clerk.
Minn.	Wabasha	2 p.m., Sept. 24	Constructing 13.96 mi. federal aid road, involving 87,089 cu. yds. excavation	John Boss, Co. Aud.
Ark.	Harrisburg	Sept. 24	Constructing 16.7 mi. of road involving 96,800 yds. of grading	County Comrs.
O.	Columbus	noon, Sept. 24	Concrete masonry retaining wall in connection with separation of street and railway grades	George A. Borden, Dir. of Pub. Serv.
Pa.	Meadville	Sept. 25	Laying creosoted block flooring on bridge	County Clerk.
Pa.	Harrisburg	10 a.m., Sept. 25	Reconstructing 1,115 ft. either vitrified block pavement or bituminous concrete on concrete foundation, 20 to 34 ft. wide, Delaware Co.; 5,091 ft. one-course plain cement concrete pavement, 18 ft. wide, Westmoreland Co.	J. Denny O'Neil, State Highway Commissioner.
Va.	Roanoke	Sept. 26	Granolithic curb and resurfacing with Bermudez asphalt	A. W. Morris, City Engr.
W. Va.	Williamson	Sept. 26	Constructing 8 mi. earth road	A. Bishop, Pres. Bd. of County Comrs.
Ga.	Griffin	11 a.m., Sept. 26	Grading, curbing, draining, and paving a number of streets with vitrified brick; grading and laying concrete sidewalks	Solomon-Norcross Co., Engrs., 1625 Candler Bldg., Atlanta, Ga.
Minn.	Winona	2 p.m., Sept. 26	Constructing 6.42 mi. federal aid road	State Hwy. Dept., St. Paul, Minn.
Ind.	Greenfield	10 a.m., Sept. 27	Constructing gravel road	Harvey J. Rhue, Co. Aud.
Ind.	Indianapolis	10 a.m, Sept. 27	Grading, draining and paving with concrete	L. K. Fesler, County Aud.
Ind.	Greenfield	10 a.m., Sept. 27	Constructing gravel road	Harvey J. Rhue, Co. Auditor.
Ind.	Noblesville	10 a.m., Sept. 28	Constructing gravel road	H. O. Cottingham, Co. Aud.
N. Y.	Hempstead	10 a.m., Sept. 28	Constructing about 12,350 sq. yds. Warrenite	Archibald G. Patterson, Town Supt. of Highways.
Pa.	Greensburg	noon, Sept. 30	Constructing following county roads: 1.79 mi., 16 ft. wide, concrete base and curb and brick surface; 3.22 mi., 17 ft. wide, slag base, concrete curb and brick surface	John S. Sell, Co. Contr.
N. J.	Trenton	10:30 a.m., Oct. 2	48,880 sq. yds. bituminous concrete surfacing (Warrenite) in Morris County and 48,580 sq. yds. concrete surfacing in Cape May Co.	State Hwy. Comn.
Ind.	Wabash	2 p.m., Oct. 8	Constructing gravel or stone road	Frank P. Kircher, Co. Aud.
Ind.	Bloomfield	2 p.m., Oct. 8	Constructing two macadamized roads	George E. Kidd, Co. Aud.
Ind.	Wabash	10:30 a.m., Oct. 8	Constructing gravel or stone roads	Frank P. Kircher, Co. Aud.
			SEWERAGE.	
Wis.	Milwaukee	10:30 a.m., Sept. 23	Installing house sewer connections	Percy Braman, Comr. of Pub. Works.
Mo.	Macon	8 p.m., Sept. 24	Constructing sewage disposal plant, including Imhoff tank, sludge bed, storm overflow and approximately 790 lin. ft. 18-in. sewer; also straightening creek channel	W. H. Martin, City Clerk.
Okla.	Okmulgee	Sept. 25	Constructing sewage disposal plant	Burns & McDonnell, Engrs., 400 Interstate Bldg., Kansas City, Mo.
Ill.	Chicago	noon, Sept. 26	Constructing and equipping sewage pumping station, involving building of concrete, stone and brick, 76.5x31 ft., with suction and discharge chambers, 5-ton hand crane and accessories, excavation, surfacing and miscellaneous work; pumping machinery, including three 30-in. centrifugal pumps, three 14-in. centrifugal pumps and all necessary valves and appurtenances, and a number of additional units; electrical equipment, including six 100-kva. transformers, three 100-hp. induction motors, three 25-hp. induction motors (vertical type), two 5-kva. transformers, oil switch equipment and miscellaneous; switchboard, conduit and wiring	John McGillen, Clerk Sanitary Dist. of Chicago, 910 South Michigan Ave.
Ia.	Charles City	2 p.m., Oct. 2	Construction work for joint drainage district	C. R. Jonts, Co. Aud.
Colo.	Brighton	8 p.m., Oct. 4	Constructing sewerage system, involving about 3,000 ft. 12-in., 1,600 ft. 10-in. and 27,000 ft. 8-in. sewer, 74 manholes, 19 automatic syphons and manholes, 1,626 wyes.	Lewis S. Bowman, Co. Aud.
O.	West Park	Oct. 10	Laying 8,600 ft. vitrified sewer pipe; brick manholes and catch basins	Village Clerk

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
			WATER SUPPLY.	
Wis.,	Milwaukee	10:30 a.m., Sept. 23.	Installing water service connections	Percy Braman, Comr. of Pub. Works.
Ore.,	Amity	8 p.m., Sept. 23.	Constructing about 12,000 ft. 4-inch wood pipe line and small concrete catch basin	R. W. Jones, Engr., McMinnville, Ore.
Can.,	Ottawa	3 p.m., Sept. 24.	Furnishing water meters	A. F. Macallum, Comm. of Wks.
Okla.,	Okmulgee	Sept. 25.	Constructing waterworks	Burns & McDonnell, Engrs., 400 Interstate Bldg., Kansas City, Mo.
Can.,	North Bay	noon, Sept. 26.	Furnishing pump and gasoline engine (direct-connected by flexible joint), capacity 1,500 gal. per minute against 280 ft. head	H. J. McAuslan, Town Engr.
O.,	Akron	noon, Sept. 27.	500 ft. 4-in., 9,200 ft. 6-in. and 2,800 ft. 8-in. c.-i. pipe	L. P. Wolff, Engr., 1000 Guardian Life Bldg., St. Paul, Minn.
Cal.,	Sacramento	10 a.m., Oct. 1.	Single stage, double suction, horizontal shaft centrifugal pumping unit, 10, 15 to 20 million gals. capacity per day; 36-in. riveted steel suction line; 30-in. c.-i. suction line; variable speed motor	M. J. Desmond, City Clerk
			LIGHTING AND POWER.	
N. Y.,	New York	10:30 a.m., Sept. 26.	Installing new grates and new boiler fronts and making alterations to furnaces in boiler plant of Metropolitan Hospital	Bird S. Coler, Comr. of Public Charities.
Colo.,	Denver	2 p.m., Oct. 1.	Furnishing 5,000-kw. vertical hydraulic turbine and generator	U. S. Reclamation Service, Washington, D. C.
Ida.,	Minidoka	Oct. 1.	Constructing power plant extension and furnishing hydraulic turbine and generator	U. S. Reclamation Serv., Dept. of Interior, Denver, Colo.
			FIRE EQUIPMENT.	
N. J.,	Lakewood	8 p.m., Sept. 23.	Combination hose and chemical motor truck (price not to exceed $4,500)	Dewitt Matthews, Sec. Fire Comrs.
N. Y.,	New York	10:30 a.m., Sept. 24.	Ten 2-ton motor-driven chasses and equipments for fire department	Thos. J. Drennan, Fire Comr.
N. Y.,	New York	10:30 a.m., Sept. 24.	Furnishing cotton rubber-lined fire hose	Thos. J. Drennan, Fire Comr.
			BRIDGES.	
Pa.,	Harrisburg	10 a.m., Sept. 23.	Rebuilding county bridge, reinforced concrete, earth-filled arch	Henry W. Gough, Co. Cont.
Pa.,	Greensburg	Sept. 24.	Constructing 35-ft. clear span, steel rod, I-beam type of reinforced concrete bridge, 20-ft. roadway	J. S. Sell, Co. Cont.
Ind.,	Lebanon	9 a.m., Sept. 24.	Constructing reinforced concrete bridge and reinforced concrete skew bridge	Cleve Goodwin, Co. Aud.
Minn.,	Mantorville	2 p.m., Sept. 24.	Hauling and placing concrete culvert and tile	State Highway Dept., Guardian Life Bldg., St. Paul, Minn.
O.,	Hamilton	10 a.m., Sept. 25.	Constructing steel and concrete bridge	County Auditor.
Wash.,	Seattle	10 a.m., Sept. 27.	Constructing approaches to bridge	C. B. Bagley, Secy. Bd. of Pub. Works.
O.,	Hamilton	10 a.m., Sept. 25.	Concrete steel bridge	W. W. Crawford, Co. Clk.
Pa.,	Harrisburg	10 a.m., Sept. 25.	1,115 ft. vitrified block or bituminous concrete, Delaware Co.; 5,091 ft. plain concrete, Westmoreland Co.	J. Denny O'Neil, State Highway Comr.
Pa.,	Meadeville	1 p.m., Sept. 25.	Laying creosoted block floors on two bridges, including removal of present roadway, cleaning and painting, &c.	County Commissioners.
O.,	Hamilton	10 a.m., Sept. 25.	Constructing concrete steel bridge	W. W. Crawford, Co. Clk.
Minn.,	Winona	2 p.m., Sept. 26.	Concrete culvert material, 12 to 48 inch, reinforced concrete culvert, 10 ft. bridge extension, two reinforced concrete 30 ft. span bridges	State Hwy. Dept., St. Paul, Minn.
Ind.,	Winchester	10 a.m., Sept. 26.	Constructing 5 bridges and repairing a number of others.	C. E. Tillson, Co. Aud.
Ill.,	Herrin	Sept. 27.	Reinforced arch	W. O. Steinheimer, Engr., City Nat. Bank Bldg.
Ind.,	Noblesville	10 a.m., Sept. 28.	Bridge work on road	H. O. Cottingham, Co. Aud.
Minn.,	Gaylord	2 p.m., Sept. 30.	Reinforced concrete culvert, 8x8x60	Fred Hoppenstedt, Co. Aud.
Minn.,	Grafton	2 p.m., Oct. 1.	Constructing bridge, 20-ft. clear span and 18-ft. roadway.	State Highway Com., Guardian Life Bldg., St. Paul, Minn.
Ill.,	Taylorville	Oct. 1.	Steel and reinforced concrete bridge construction	C. Pennington, Supt. of Hwys.
W. Va.,	New Martinsville	Oct. 1.	Constructing seven bridges	S. Myers, County Clk.
N. D.,	Jamestown	Oct. 2.	Constructing bridges	Co. Aud.
			MISCELLANEOUS.	
Ill.,	Springfield	noon, Sept. 23.	Excavating and grading for Centennial Memorial Building	Div. of Architecture, Construction and Inspection, State Capitol.
Minn.,	St. Paul	2:30 p.m., Sept. 23.	Clearing, stumping and grubbing lands in St. Louis Co.	State Auditor.
D. C.,	Washington	Sept. 23.	Four 10-ton electric traveling cranes, overhead bridge type, each equipped with two 5-ton trolleys and installed on runways at Navy Yard, Norfolk, Va. (Spec. No. 3309)	Bureau of Yards and Docks, Navy Dept.
Wash.,	Seattle	11 a.m., Sept. 23.	Furnishing iron and steel, castings, etc	General Purch. Agt., Alaskan Engrg. Com., Bell St. Terminal, Seattle, Wash.
D. C.,	Washington	2 p.m., Sept. 24.	Furnishing oil engine-driven hoisting engine	Supt. of Lighthouses.
Utah,	Parowan	10 a.m., Sept. 24.	Driving about 7,600 ft. tunnel 4x6 ft. through ridge; excavating open cuts leading to portals of tunnel	Caldwell & Richards, Engrs., 520 Vermont Bldg., Salt Lake City.
N. Y.,	New York	noon, Sept. 27.	Reception, transportation and final disposition of ashes, street sweepings and rubbish in boroughs of Manhattan and the Bronx; also in Brooklyn	A. B. MacStay, Comr. of Street Cleaning.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Tenn.,	Memphis	11 a.m., Sept. 28	Constructing about 123,000 cu. yds. of earthwork	Mississippi River Commission, Custom House.
Mass.,	Nahant	noon, Sept. 30	Constructing pile wharf	U. S. Engr. Office, Boston, Mass
Mass.,	Boston	noon, Sept. 30	Constructing pile wharf at Nahant, Mass	U. S. Engr. Office
Tex.,	El Paso	Oct. 1	Constructing canals on Rio Grande irrigation project, involving about 63,800 cu. yds. excavation, near Hatch, New Mexico	U. S. Reclamation Service, Washington, D. C.
D. C.,	Washington	2 p.m., Oct. 4	Furnishing track scale at St. Elizabeth's Hospital	S. G. Hopkins, Asst. Secy., Dept. of the Interior.
Tenn.,	Memphis	Oct. 7	Furnishing and loading about 12,000 cu. yds. riprap stone on government barges	Mississippi River Com., Custom House.
N. Y.,	Albany	noon, Oct. 8	Four barge canal terminal improvements, as follows: Constructing freight house, heating, and installing plumbing and water supply systems at Erie basin, Buffalo; repairing existing bulkhead and constructing freight house and crane track at East River, N. Y. C.	W. W. Wotherspoon, Supt. of Public Works.
Port Rico,	San Juan	10 a.m., Nov. 25	Construction and installation of garbage and refuse incinerator plant	Bur. of Insular Affairs, War Dept., Washington, D. C.

ROADS AND STREETS

Montgomery, Ala.—$140,000 will be invested by war department to build a road at Camp Sheridan. Capt. M. G. McDonald, camp construction quartermaster.

Opelika, Ala.—A highway from this town to Gold Hill, distance of 12 miles, may be constructed by Lee county.

Sheridan, Ark.—The construction of 14½ miles of gravel road may be undertaken by Grant County Road Improvement Dist. No. 2. Bids may be asked late in Sept. W. H. Rhoes, secretary, Erin, Ark. Parkes Engineering Co., engineers, Pine Bluff.

Manteca, Cal.—See "Sewerage."

Merced, Cal.—$1,250,000 worth of bonds will be voted on in November. Object of bonds: Improvement of highway in Merced county.

Riverside, Cal., will improve Box Springs Highway, from Gage Canal, on E. 8th St., to the Santa Fe Railway, at the top of hill. Three ft. to be added to paved road both sides and present road improved.

Santa Ana, Cal.—Edinger St. will be paved. It will connect Santa Ana St. with paved country roads to southwest.

Pensacola, Fla.—Road improvement planned by Escambia county from Pensacola to Molino to connect with Molino bridge, to cost in neighborhood of $20,000; $10,000 given by State.

Davenport, Ia.—City will pave Hilltop Ave.

Kellogg, Ida.—Bonds will be sold Sept. 25, Imp. Dist. No. 1, paving and curbing, $14,772, 7%.

Lewiston, Idaho—Commissioners of the Lewiston highway district and the board of county commissioners will make an inspection of the county road along the north bank of the Clear Water river, between Hatwai creek and Spaulding, with a view of adopting some plan for the improvement of same.

Champaign, Ill.—City will lay a sidewalk along north side of Clark St., from Neil St. to Prospect Ave.

Gillespie, Ill.—Macoupin and Elm Sts. will be improved. City Engr., A. Stanfield. Approximate cost, $35,000.

Great Lakes, Ill.—See "Bridges."

Lewistown, Ill.—Issuance of $60,000,000 road bonds contemplated. Address E. F. Motsinger, county supt. of highways of Fulton county.

Indianapolis, Ind.—Will sell $62,400 worth of bonds, 4½%, 10 years, for highway improvements.

Indianapolis, Ind., is being assessed for the following improvements: The North Drive of Brookside Parkway from the west curb line of Hamilton Ave. to the property line of the first alley east of Samoa St. (except the sidewalk wings at Hamilton Ave. and Samoa St.); grading and paving the sidewalk with cement to a uniform width of 6 ft., placed 6 ins. from the property line; providing double strength street crossings at Hamilton Ave. and Samoa St.; providing double strength alley crossing at first alley east of Hamilton Ave.; grading the lawns wherever disturbed in the construction of the sidewalk, all in accordance with the profile, details, drawings and specifications on file in the office of the Board of Park Commissioners of said city. Brookside Parkway, South Drive, from a point 4 ft. east of the east property line of Keystone Ave. to a point 1 ft. west of the west property line of Oxford St. (except the sidewalk wings at Tacoma Ave., Temple Ave. and Rural St.), grading and paving the sidewalk with cement to a uniform width of 6 ft., placed ½ ft. from the property line; providing double strength street crossings at Tacoma Ave. and Temple Ave.; providing double strength alley crossing at first alley east of Rural St.; grading the lawns whereever disturbed in the construction of sidewalk, all in accordance with the profile, details, drawings and specifications on file in the office of the Board of Park Commissioners of said city. Brookside Parkway, South Drive, from a point 66.19 ft. west of the west property line of the first alley northwest of Nowland Ave., to a point 5 ft. northwest of the north property line of Nowland Ave., grading and paving the sidewalk with cement to a uniform width of 6 ft., placed 5 ft. from the property line; providing a double strength alley crossing at the above mentioned alley; grading the lawns wherever disturbed in the construction of sidewalk, all in accordance with the profile, details, drawings and specifications on file in the office of the Board of Park Commissioners of said city. Fred C. Gardner, Edward A. Stuckmeyer, Chas. E. Coffin, Samuel E. Rauh, board of park commissioners, city of Indianapolis.

Terre Haute, Ind.—Wants to pave Fort Harrison road. Vigo county council of defense.

Great Bend, Kan.—City will do road work, about 30 miles brick. Engineer, W. F. Armstrong.

Independence, Kan.—This town rejected all bids for paving 12th St; too high.

Parsons, Kan., will do paving on 27th St. (one block vertical fibre brick). Engineer, W. H. Cutz.

Pittsburg, Kan., will pave sidewalks. Engineer, L. D. Cornelius.

Frankfort, Ky.—R. Wiley, commissioner of public roads, did not receive bids for improvement of Grayson-Boyd county road from city limits of Grayson to Boyd county line in Carter county; about 11.27 miles distance.

Slidell, La., plans to spend $30,000 in street improvement.

Cumberland, Md., will grade and pave on Green St. City clerk.

Lansing, Mich.—Following street work will be undertaken: A new artificial stone sidewalk 6 ft. wide will be built in front of commencing at southwest corner Warner St. and Princeton Ave., south 70 ft., west 34½ ft., north 70 ft., east 34½ ft. to beginning on n. e. ¼ of s. e. of section 8 on the west side of Princeton Ave., owned by F. W. Pankratz. Also in front of commencing 12 rods south of southeast corner of Logan and Warner Sts., south 132 ft., east 69 ft., north 62 ft., west 34½ ft., north 70 ft. to beginning on n. e. ¼ of s. e. ¼ section 8 on the west side of Princeton Ave., owned by Mrs. A. Baske. Judson A. Parsons, city clerk.

Lansing, Mich.—Will pave Pennsylvania Ave. from Saginaw to Sheridan St.

Lansing, Mich.—The alley in block bounded by Kalamazoo, Marcus, Lathrop and Clifford Sts. will be graded and graveled.

Lansing, Mich.—Assessments are to be made for grading and graveling Clemens Ave.

Lansing, Mich.—The grading for paving Logan, Butler and Isaac Sts. bond of Farrell Bros., as principal with Schuyler Champion and James Fleming as sureties, was approved.

Saginaw, West Side, Mich.—Highway may be improved in southern part of Saginaw county. County engineer.

Woodville, Miss.—$60,000 worth of bonds were voted to construct Prentiss highway through county. Details given by county commissioners.

Woodville, Miss., is issuing $60,000 bonds for building of Prentiss Highway across the county. Chairman board of county supervisors.

Great Falls, Mont.—Council has passed a resolution providing for the grading of 18th St. north from Central Ave. to Third Ave. north; also for the grading of Second Ave. southwest from 10th St. to 11th St. et al.

Livingston, Mont.—Plans are being formulated for repairing the road between Gardner and Cooke City.

Benton, Mo., intends to build a highway to cost $200,000; 27½ miles gravel. Engineer, M. S. Murray, Sikeston, Mo.

St. Joseph, Mo.—2.2 miles Pike's Peak highway building is contemplated, to consist of asphaltic concrete, cost about $40,000. Engineer, R. L. Cargill.

Kearney, Neb.—Paving will be done in following places: Paving Dist. No. 32, Paving Dist. No. 33, in alley running east and west between block 12, Metcalf's Addition to Central City, Neb.

Lincoln, Neb.—Assessment will be made for the following street improvements: Paving of Legros Ave., paving in 12th St., between north line of J St. and south line of M St.; street work in 17th St., between south line of F St. and south line of L St.; street work in 15th St., between north curb line of Poplar St. and south line of Garfield St.; street work in M St., between east line of Ninth St. and west line of 11th St.; street work in 32d St., between north line of Randolph St. and south curb line of J St.; street work in alley paving district No. 102, between N and O Sts., lying between east line of 19th St. and a point 300 ft. east of the east line of 19th St.; street work in N St., between east line of 27th St. and west line of 29th st.; street work in Ryons Ave., between west curb of Garfield Blvd. and east curb line of 27th St.; street work in 31st St., between north line of Randolph St. and south curb of J St.; street work in alley paving district No. 101, between J and K Sts., lying between east line of 17th St. and west line of 18th St.; street work in alley paving district No. 113, between Ninth and Tenth Sts., lying between north line of L St. and south line of M St.

Omaha, Neb.—23,500 cu. yds. Road No. 41 will be built by Douglas county. This road is known as Leavensworth St. F. Dewey is county clerk.

East Orange, N. J.—Ordinance passed for following purpose: Section 1—That a public street, as an extension of South Arlington Ave., be laid out and opened for public use; and that said street be 80 ft. in width and 40 ft. on either side of the following described center line, to wit: Beginning in the southwesterly line of Central Ave., at a point therein distant 267.36 ft. northwestwardly from the intersection of the southwesterly line of Central Ave. with the northwesterly line of Freeman Ave., as measured along said southwesterly line of Central Ave.; thence in a course south 26 degrees, 51 ft., 26 in., west 836.72 ft. to the northeasterly line of Elmwood Ave., at a point therein distant 208.25 ft. from the intersection of the northeasterly line of Elmwood Ave. with the northwesterly line of Freeman Ave., as measured along said northeasterly line of Elmwood Ave. Lincoln E. Rowley, city clerk.

Newark, N. J., will do the following street improvements: Paving Ave. R (proceedings for the change of the name of which to Doremus Ave. are now under way), as follows: From the Lincoln Highway to Doremus Ave. (proceedings for the change of name of which to Wilson Ave. are now under way), a roadway of 30 ft. in width to be paved with old granite blocks on a sand or cinder foundation; from Doremus Ave. (now being changed to Wilson Ave.) to the northern abutment of the viaduct over the Oak Island Yard of the Lehigh Valley Railroad, paving a roadway 12 ft. wide on either side of the street railway tracks of the Public Service Railway Co. and paving inside and between said tracks; from the southerly end of the viaduct over the Oak Island Yards of the Pennsylvania Railroad Co., paving a roadway 12 ft. wide on either side of the street railway tracks and paving inside and between said tracks of the Public Service Railway Co. to the foot of the approach to viaduct, a distance of approximately 985 ft.; thence curving to the right and then to the left on a reversed curve with a radius of about 320 ft., for a distance of approximately 250 ft., paving a roadway 30 ft. wide; thence continuing (southerly) along Avenue R (now being changed to Doremus Ave.), adjoining trestle into Submarine Boat Corporation, paving a roadway of 30 ft. to Port St., centre line of said roadway being 30 ft. west of the center line of Ave. R, including the pavement of all tracks and between tracks from the foot of the south approach to the viaduct over Oak Island Yards southerly to southerly end of reversed curve previously mentioned. All paving to be laid with old granite blocks on a sand or cinder foundation. The cost of at least the paving inside the street railway tracks, between said tracks and 18 ins. outside of the street railway tracks, will be assumed by the city, said paving work to include all necessary header or other curb. Thos. L. Raymond, Director, Dept. of Sts. and Pub. Impts.

Newark, N. J.,—Contemplates street work as follows: Paving Wilson Ave., from the westerly line of Ave. L to a point about 600 ft. south of Ball's Lane, as follows: From the westerly line of Ave. L about 450 ft. easterly to the west approach of viaduct over the Central Railroad, paving a width of roadway, including the street railway tracks, of about 40 ft. From 450 ft. east of the west side of Ave. L, paving the northerly roadway to the west track of the Central Railroad of New Jersey; thence from the easterly track of the Central Railroad of New Jersey, paving the northerly roadway to the easterly end of viaduct over the Central Railroad tracks; thence paving a width of roadway of about 40 ft., including the street railfay tracks, to a point about 600 ft. south of Ball's Lane. All paving to be paved with old granite blocks on a sand or cinder foundation. The cost of at least the paving inside the street railway tracks, between the street railway tracks and 18 ins. outside of the street railway tracks, will be assumed by the city. Thomas L. Raymond, Director, Dept. of Sts. and Pub. Improvements.

Newark, N. J.—Passaic River bridge at Two Bridges will soon be replanked, $1,547.

Newark, N. J.—City contemplates the repaving of Central Ave., from Plane St. to High St., the portion between Plane St. and Burnet St. to be repaved with 4-inch wood block pavement on a new six (6) inch concrete foundation, and the portion between Burnet St. and High St. to be paved with napped reclipped granite block pavement on the old concrete foundation. The paving and repaving of Rockland Ter., from Stuyvesant Ave. to Smith St. William Dimond, August Soffel, Bernard K. Judge, commissioners of assessments for local improvements.

Passaic, N. J.—Grading around pumping station is to be changed from an ash fill to clay.

Passaic, N. J.—The freeholders disposed of a $239,000 issue of road bonds, the bonds being taken by George B. Gibbons & Co. of New York, at their bid of $230,100 for 236 bonds. The bid was considered a good one considering war conditions. Harris Forbes & Co. and Remick Hodges Co. bid $239,279.94 for 237 bonds.

Gallup, N. M.—Will undertake street improvement. Town clerk.

Brooklyn, N. Y.—Regarding the application of the City of New York, relative to acquiring title in fee to the lands, tenements and hereditaments required for the purpose of opening and extending Twenty-fourth Ave., from Stillwell Ave. to Cropsey Ave., excluding the right of way of the Brooklyn, Bath and West End Railroad, in the 31st Ward of the Borough of Brooklyn, the City of New York, the Supreme Court will render decision in this matter.

Brooklyn, N. Y., will do street work on 44th St., from First Ave. to Second Ave.

Brooklyn, N. Y.—The board of estimate and apportionment is considering the advisability of initiating proceedings for a certain local improvement, described as follows: To regulate and grade, set curb and lay cement sidewalks where necessary, and lay a permanent granite pavement on 44th St., from First Ave. to Second Ave., Borough of Brooklyn. There has been presented to the board of estimate and apportionment an estimate in writing in such detail as the board has directed that the cost of the proposed work or improvement will be the sum of $14,700.

Canton, O.—This city will be permitted to improve only Lincoln highway in Stark county. All other work is prohibited by government for the present.

Kalida, O.—This town will accept proposals Sept. 23 for street repair bonds, $25,000, 6%. I. F. Stanfer, village clerk.

Middleton, O.—Owing to shortage of labor, street work contracted for is going to be done by the city instead of by contractors.

Youngstown, O.—Bids will be received Sept. 23 for sidewalk bonds on Overland St., $25,125, 5%, average 4 years. C. J. R. Edwards, city auditor.

Eufaula, Okla.—Paving bonds were authorized $56 560.10.

Klamath Falls, Ore.—Surveying of the new road from the Shippington highway, via Helliken Bay sawmill to the Fort Klamath road, has been completed by State Engineer J. H. Scott. Expected bids for improvement will be advertised for in the near future.

Oregon City, Ore.—Five miles of hard surface will be the goal for county paving operations in Clackamas county in 1918. With the completion of a 1-mile stretch, between Milwaukee and Clackamas, from the Milwaukee city limits, a little over 2¼ miles have been laid since early in July.

Portland, Ore.—Fessenden St., from the southwesterly line of Bradford St. extended northwesterly to the southwesterly line of Edison St., will be improved.

Portland, Ore.—City intends to undertake the construction of reinforced concrete viaduct, 15,000 cu. yds. grading.

Portland, Ore.—City intends to improve Sherlock Ave.

Portland, Ore., has rejected bids for the Three Rivers National Forest road project located partly within the Siuslaw National Forest in Tillamook county. The length of the project to be constructed is approximately eight miles and the principal items of work consist of 24 acres of clearing and grubbing, 30,000 cu. yds. of common excavation, culverts, etc., and 10,000 cu. yds. of surfacing.

Bellevue, Pa.—New bids will be taken by borough council for street work. Engineers, McBridge Engr. Co.

Bethlehem, Pa.—Bethlehem has to do its own paving on Wyandotte St., South Side, south of Wood St. Contractors who had agreed to do the work declared they were unable to carry out contract.

Bethlehem, Pa.—$20,000 will be spent on street paving. Robt. L. Fox, engineer.

Beaver, Pa., intends to pave Seventh Ave. hill.

Dorranceton, Pa.—Will pave Market St., about 18,000 sq. yds. Engineers, Young & Wintermute, Second Natl. Bank bldg., Wilkes-Barre, Pa.

Harrisburg, Pa.—City received no bids for paving in Lehigh county. Wm. D. Uhler, engineer, Harrisburg, Pa.

Pittsburgh, Pa.—West Carson St., from Point to Stuben St., will be widened.

Abilene, Tex.—Elections in Road Dists. Nos 3 and 4 of Taylor county, Sept. 14, on $15,000 bonds each. Address E. M. Overshiner, county judge.

Brownsville, Tex.—Election planned in Cameron county, on bonds for highway between Gulf of Mexico and western county line. Address H. L. Yates, county judge.

Hillsboro, Tex.—A paved highway from Denver to the Gulf is contemplated.

Hillsboro, Tex.—Proposed $2,980,000 road bonds defeated in Hill Co. Address R. T. Burns, county judge.

Mineral Wells, Tex.—Palo Pinto county intends to build a good road to the oil fields, including Caddo. The county has $60,000 for that purpose.

Ogden, Utah—At a session of the city commissioners, bids were submitted for paving district No. 128, which includes Washington Ave. from the Ogden River bridge to the city limits. The bids submitted were from the P. J. Moran Contract Co., Salt Lake; Warren Brothers Contract Co., Salt Lake; Strange-Maguire Paving Co., Salt Lake; J. W. Mellon Contract Co. A bid was also received from Warren Brothers Co., for furnishing bitulithic pavement to the successful bidder.

Colfax, Wash.—Imp. Road No. 2, known as the Spring Flat-Four Mile road, will not be allowed by government to be built.

Colfax, Wash.—Bid accepted of Ferris & Hardgrove, Spokane, for placing of bonds for Steptoe-St. John-Ewan road. Total amount, $242,000.

Seattle, Wash.—Following streets will soon be improved: 6th Ave. N., Meade St., Brandon St.

Outgamie County, Wis.—Highway improvement bonds will be sold, Sept. 27; $272,000; 5 per cent.; aver. 9 yrs. Wm. F. Wolf, county clerk., P. O., Appleton.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Oakland, Cal.—*Bates & Boriland will build a road between Decoto and Irvington; $103,580.

Vallejo, Cal.—*Worswick Construction Co. will pave Pennsylvania, York and El Dorado Sts., $34,646.23.

Decatur, Ind.—*Michael Miller will put a brick pavement on Jackson St.

South Bend, Ind.—*Reight & Reilley, Goshen, will lay 4,500 ft. of road in Union st. at 63.5 cts. per sq. yd.

Rock Island, Ill.—*Walsh Construction Co. for road building for U. S. Government, $20,000.

Springfield, Ill.—*Chicago Heights Coal Co., Chicago Heights, will do road improvement for department of public works and buildings, division of highways.

Sterling, Ill.—*Sell Kollar, Pana, will do concrete paving on W. 12th & W 13th Sts. for $13,627.

Hoisington, Kan. — *Stamey-Mackey Construction Co., Hutchinson, will lay brick pavement on 5 blocks for $20,000.

Baltimore, Md., has street work done by *John Danini, 20 N. Curley St.

Salem Mass.—*Bids were opened for two city bond issues, one of $45,000, for the paving of Boston St., and one of $22,000, for additional expenses of the water supply. The contract for both lots was awarded to Easterbrook & Co. of Boston at 100.85. The other bids were as follows: Arthur Perry & Co. of Boston, 100.40; Edmund Bros. of Boston, 100.267; E. H. Rollins of Boston, 100.767; Blodgett & Co. of Boston, 100.52; Curtis & Sanger of Boston, 100.42; Morrill & Oladham of Boston, 100.179.

Aitkin, Minn.—*J. H. Kinsella will do road work at Tamarack, $7,896.08.

Virginia, Minn.—*C. A. Johnson will pave Mountain Iron road and Eveleth highway.

Grent Falls, Mont.—This town has let two contracts for the grading of as many pieces of road leading into Gordon from the north and east, the new highways connecting the town with roads already opened. The contracts were awarded to *J. W. Linville, the total consideration

being $2,709.40. Between five and six miles will be graded, according to the specifications.

Camden, N. J.—*Ralph Sangiovanna, Newark, N. J., will grade Route 3, Ancora Atco section, Camden.

Newark, N. J.—*Northern Constr. Co. will place new curbing in Bloomfield Ave., running through Bloomfield, Montclair, Verona and Caldwell, $27,500.

Hempstead, N. Y.—*Both & Weston, for sanding several highways in Hempstead; $75 per mile.

Schenectady, N. Y.—*Dominick Lewis will lay sidewalk in Ninth Ave., $1,225.

Kenmore, N. Y.—*Federal Conc. Co., Inc., Mutual Life Bldg., Buffalo, N. Y., will pave Linden & Delaware Aves. for $6,000. Engrs., White & Getman, Mutual Life Bldg., Buffalo.

Columbus, O.—*Johnson Construction Co., 38 South Dearborn St., Chicago, will do road improvement in Allen Co., for $72,522. *John Karsh, Celina, O., will do road improvement at Allen Co., $32,000. Franklin county roads will be improved by the *Ohio Permanent Roads Construction Co., and Logan county roads by *W. F. Payne, Springfield.

Lock Haven, Pa.—Successful bidder for wood block paving on bridge over Fishing Creek, in Porter township, was Groton Bridge Co., Groton, N. Y.

Plains, Pa.—*Moses Griffith will pave 6,000 sq. yds. of street for $18,000.

Seattle, Wash.—*Hans Pederson, Alaska bldg., will widen roadway at Harward Ave.; $5,342.50.

Seattle, Wash.—*R. G. Stevenson, contractor, will pave Beacon Ave.

Madison, Wis.—*Welch Construction Co., Minneapolis, Minn., have contract to pave road from Fond du Lac to Oshkosh, $80,000. Division engineer, A. P. Hirst, Madison, Wis.

SEWERAGE AND SANITATION

Talladega, Ala.—$5,000 will be spent by this county for a new sanitary sewer system. State will add another $5,000.

Tuscumbia, Ala.—A new sewage system is contemplated; 18 miles pipe will be needed for it. Approximate $15,000.

Manteca, Cal.—The South Joaquin Irrigation district intends to spend $500,000 for improvements, including road work and a drainage system.

Creston, Ia.—City will shortly improve sewer system. This entails placing of 500 lin. ft. 10-in. and 4,230 lin. ft. 8-in. sewer, 75-ft. manholes and 4 flush holes. T. S. De Lay, engineer.

Des Moines, Ia.—Des Moines may soon have a sewerage system. Engr., K. Kastberg.

Wichita, Kan.—Will issue bonds for constructing sanitary sewer amounting to $185,000.

Newport, Ky.—May build a $50,000 storm sewer. Jos. Hermann, engineer.

Paducah, Ky.—A drainage system to cost $300,000 is taken under consideration by the Mayfield drainage district.

Allegan, Mich.—The contract for constructing the Brush Creek drain has not been awarded.

Detroit, Mich.—Ford village will be provided with sewerage connection if bond issue is approved by taxpayers.

Lansing, Mich.—City voted sewer bonds, $4,000, for construction of sewer in Harton Ave., Fairview St., Elizabeth St. and Clemens Ave.

Lansing, Mich.—The following bids were received for constructing of sewer in Forest Ave., from sewer in Mt. Hope Ave. to Marvin drain: James Furgeson, $1,115; E. J. Noyce, $1,120.

Billings, Mont.—That the city abandon the North side drainage ditch and build a large storm sewer to replace it, was the recommendation of the city council of a representative of the Alvord & Burdick Engineering Co. of Chicago.

Kansas City, Mo.—A new sewer will be built in Dist. No. 467, Div. No. 5, to consist of 3,320 ft. 10-in. and 3,360 ft. 12-in. concrete or vitr. sewer pipe. C. Hill, city engr.

Durham, N. C.—Town will spend $75,000 for extension of sewage system. City Engr., W. Kueffner.

Dover, N. J., intends to issue $300,000 in bonds for a new sewer.

Pensauken, N. J.—A sanitary sewer system will be built. Engineers, Remington & Vosbury, 6th and Market Sts., Camden, N. J.

New Rochelle, N. Y.—Voted $3,000 for bonds to put a new drain in Washington Ave.

Ashtabula, O.—This city seems now on the highroad of finishing its sewage disposal plant, begun eight years ago.

Cincinnati, O.—Sewer improvement will be made at Rulisan Ave., from Cleves pike to Zula Ave.; Coronado Ave., from Rapid Run road to Zula Ave.; Zula Ave., from Coronado Ave. to Loretta Ave.; Loretta Ave., from Zula Ave. to existing trunk sewer. Fred Schneller, clerk.

Cincinnati, O.—City will undertake sewering the following: Rulison Ave., from Cleves pike to Zula Ave.; Coronado Ave., from Rapid Run road to Zula Ave.; Zula Ave., from Coronado Ave. to Loretta Ave.; Loretta Ave., from Zula Ave. to existing trunk sewer.

Dennison, O.—Received no bids for repair of storm sewer.

Lima, O., will build an auxiliary sewer.

Lima, O.—A system of sewerage of a part of the city of Lima, to be known as the Collet relief sewer subdivision of the North Lima sewer district, will be installed. James I. Heffner, clerk.

Newcomerstown, O.—No bids received by village for an 1,870 lin. ft. 18-in. sewer from west corporation line to Tuscarawas river, besides rebuilding 8-in. sewer in North Bridge St. R. L. Chanly, clerk.

Springfield, O.—An 8-in. vitrified pipe sewer will be built with 24-in. pipe for outlet in Rubsam St. from Light to Race Sts. with connecting sewer in Race St. from Rubsam to Cedar St. City engineer, M. Bahin.

Warren, O.—Sewer bonds will be sold, Oct. 12; $19,000; 6 per cent.; aver. 4 yrs. Sub district No. 1 sewer bonds will be sold Oct. 12; $4,000; 6 per cent. aver. 4 yrs. Geo. T. Hecklinger, city auditor.

Youngstown, O.—Sewer repair bonds will be sold, Sept. 13; $7,500; 5 per cent.; aver. 13½ yrs. J. R. Edwards, city auditor.

Okmulgee, Okla.—See "Water Supply."

Ontario, Ore.—The city council at its special meeting abandoned its plan for a trunk system in that part of the city. In lieu thereof the property owners interested were advised to petition for a lateral sewer to connect with sewer No. 2 on the west side of the tracks. This they indicated they would do at once.

Portland, Ore.—City will be assessed for the construction and repair of the Tanner Creek sewer from a point on 17th St., 485 ft. south of Taylor St. and running in a northeasterly direction to the Willamette river at a point near the intersection of Pettygrove St. and Front St.

Du Bois, Pa.—New bids will have to be made for sewer in Shaffer Ave. F. C. North, engineer.

Glen Osborne, Pa.—A sewer may be laid; $1,000. Engineer, W. M. Cotton, Edgeworth, Pa.

Mobridge, S. D.—$50,000 worth of bonds will cover cost of extension of sewerage system.

Electra, Tex.—Is constructing a septic tank in conjunction with complete sewerage system.

Medow Lake, Wash.—Bids for drainage ditch No. 2 were too high, so were rejected. Contemplated cost, $23,063.

West Allis, Wis.—Town will spend $20,000 for a storm sewer. Bonds will be issued.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Newport Beach, Cal.—*Board of trustees has awarded contract for new sewer system to J. D. Kneen Co., Los Angeles.

Duluth, Minn.—*Leonard Hedberg will construct a sanitary sewer for $4,401.95. The sewer will be laid in 69th Ave. west and Grand Ave. from Raleigh St. to 71st Ave. west.

Duluth, Minn.—*Gust Hiner, for constructing sanitary sewer in Third alley; $398.

Charlotte, N. C.—*Porter & Boyd, Charlotte, will build a sewer system for Camp Bragg, Fayetteville.

WATER SUPPLY

Marianna, Ark.—This city realized, after a terrible fire, that its water system is inadequate.

Mare Island, Cal.—U. S. will spend $48,000 at Mare Island for well boring. C. W. Parks, chief, bureau yards and docks, navy department, Washington, D. C.

Modesto, Cal.—$3,000,000 in bonds will be issued to build the Dom Pedro dam for the Modesto and Turlock irrigation projects.

Newport Beach, Cal.—Newport Mesa district will install a new pumping plant.

Oakdale, Cal., may soon have two large new pumping plants operated electrically, to cost $150,000.

Val Verde, Cal.—Pumping stations with their apparatus will be put into the new irrigation works. Stations to be driven by electricity.

Putnam, Conn.—Bids will be called for $75,000 worth of water pipe line between Putnam and Harrisville; about 2 mi. 16-in. water pipe. O. D. Sharpe, superintendent of water department.

Pensacola, Fla.—City will spend $25,000 for water works.

Monticello, Ind.—$8,000 invested in bonds for water works.

Mt. Carmel, Ill.—Will install about 50 water service connections.

Pleasantville, Ia.—City wants to spend $17,000 for water works.

Baxter Springs, Kan.—Will probably build 2 deep wells. Bids to be called at once; 1,000 ft. deep each. Cost, $85,000. Engineer, A. C. Moore, Frisco bldg., Joplin, Mo., and Baxter Springs.

Belleville, Kan., will have a new 500,000-gal. concrete reservoir for water storage. Bids will soon be asked.

Hope Kan.—Empire Construction Co., Kansas City, Mo., will install new water works. Cost, $17,549, exclusive of tower.

Ottawa, Kan.—May have a new chlorine purification system at the waterworks.

Stithton, Ky.—$15,000,000 will be invested in water works and other improvements by War Dept.

Midland, Mich.—Midland will have a water testing station and a filter plant. Engr., S. A. Greeley, Schiller Bldg., Chicago, Ill.

Wyandotte, Mich.—Intends to sell $280,000 worth of water bonds for a filtration plant.

Eden Valley, Minn.—This village will soon have new water mains and hydrants. W. R. Salisbury, village recorder.

Tyler, Minn., will have to repair its water system wrecked by a storm.

Harrisburg, Miss.—Will spend $20,000 for waterworks improvement.

Richmond, Mo., will build additional filter plant, etc. Black & Veatch, 502 Interstate Bldg., Kansas City, engineers.

Vandalia, Mo., may drill deep well and install pump, 100 gals. per minute. W. T. Waters, mayor.

Butte, Neb.—This city will soon install a water works system for pumping station, to consist of one 10-h. p. oil engine, one 2-stage centrifugal pump, 4,100 ft. 6-in., 85-lb. pressure wood pipe couplings, 6-in. cast iron crosses and 5 hydrants, to cost about $6,700. E. W. Williams, clerk.

Gloucester, N. J.—Town will have a $20,000 water supply system in the new shipyard village.

Fredonia, N. Y.—Will improve its water system.

Southampton, N. Y., will reconstruct or replace the tide gates in the Shinnecock and Peconic Canal.

Syracuse, N. Y.—A settling tank will be installed near Barge Canal harbor; $100,000. City engineer, H. C. Allen.

Akron, O.—Ordinance passed to sell water bonds; $1,350,000; 5 per cent.

Cambridge, O.—Will make waterworks repairs; $50,000. T. D. Lee, director public service. Engineer, Karl M. Cosgrove, city hall.

Eaton, O.—Worthington Pump & Machinery Co., 115 Broadway, N. Y., awarded contract for waterworks improvement at Eaton by board of public affairs; $5,500.

Hamilton, O.—$60,000 was voted for water extension bonds.

Wilburton, O., will probably spend $30,000 for water works.

Chickasha, Okla.—Will extend its water system. E. G. Reynolds, city clerk.

Geary, Okla.—Two water wells will soon be drilled. They are to be 20 and 24 ft. diameter, brick and reinforced concrete.

Hominy, Okla.—$50,000 will be invested for adequate water supply. L. Hall, city clerk.

McAlester, Okla.—Town wants to issue $720,000 in bonds for a better water system.

Okmulgee, Okla.—Will build waterworks and sewage disposal plant; $535,000. O. K. Peck, mayor. City engineers, Burns & McDonnell.

Salem, Ore.—Town is in the market for 500 water meters.

Windsor, Ont., intends to invest from $250,000 to $300,000 in a 12,000,000 gal. a day filter plant.

Durkee, Ore., wants to build a reservoir for storing of flood water.

Medford, Ore.—A bond issue for a $1,500,000 irrigation project will be made.

Pendleton, Ore.—Will vote on $20,000 water bond issue to extend city water systems to Chaplish Springs, now under way.

Portland, Ore.—Clark, Kendall & Co. have underwritten the issue of $750,000 of bonds of the Warm Springs Irrigation System District, subject to governmental approval.

Salem, Ore., may buy following apparatus for water system: One triplex pump, $6,000; three deep well pumps, $4,500; one small air compressor and motor for Garfield Ave. wells, $1,500.

Mt. Auburn, Tex.—Water mains will be laid in several streets. Approximate cost, $12,000.

Othello, Wash.—An ordinance has been passed by the town council providing for the issuance of bonds in the sum of $7,800 for betterment and extension of the present water system. A. E. Ogden, clerk.

Seattle, Wash.—Ordinance passed authorizing and directing Water Dept. to extend and enlarge existing water supply system at Lake Union U. S. Naval Training Station.

Seattle, Wash.—City Council passed ordinance authorizing and directing Board of Pub. Works to construct three wooden water tanks in West Seattle, and appropriating $6,000 therefor.

Snohomish, Wash., may extend its water system to district outside of city.

Clarksburg, W. Va.—Clarksburg will vote on $300,000 bonds to extend water works system. J. N. Craddock, mayor.

Mantowac, Wis.—See "Sewerage."

Mt. Pleasant, Wis.—This town will construct a breakwater, 4,000 lin. ft., $100,000. Engineer, P. J. Hurtgen, city hall, Kenosha.

Riverton, Wyo., has issued $23,500 in bonds for water works. F. A. Michels, clerk.

Thermopolis, Wyo.—Contract for improving water works system soon let by city. Work involves replacing 1,200 lin. ft. 1-in. with 4-in. main, replacing 920 lin. ft. 6-in. with 4-in. wood main and resetting approximately 29 service connections. About $25,000.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

San Diego, Cal.—Contract for constructing water system at La Plaza was awarded to *The Henry Clarke Co., Los Angeles, $13,543.

Ayrshire, Ia.—*Des Moines Bridge & Iron Co. was awarded contract for $6,125 standpipe; that for mains was given to Peter N. Kruse, Spencer, $4,080.

Crosby, Minn.—*Pastoret Construction Co., Duluth, received contract for water extension, $56,891.

Duluth, Minn.—*D. H. Clough & Co. for constructing 8-in. water and 6-in. gas mains in 85th Ave. W. from existing mains in Grand Ave. to south line of Industrial Ave; $1,320.

Duluth, Minn.—*D. N. Glough & Co., 914½ E. 1st St., awarded contract by city council for water and gas mains.

Hibbing, Minn.—*Crane & Ordway, Duluth, Minn., rectived contract to install water works.

Bayonne, N. J.—*C. J. Cogan will lay water pipes for city. Approximate cost, $10,083.

Boonton, N. J.—*Peter Telfer, of Cornelia, at Boonton, was awarded by town council contract for waterworks improvement; $4,480.

Charlotte, N. C.—*Porter & Boyd have contract to supply camp at Charlotte with supplementary system of water mains for fire protection.

Weston, Ont.—*G. B. Moogh, Main St., will build for town additional pump station and filter house. Approximately $7,000.

Providence, R. I.—*E. W. Foley Construction Corpn., 34 Pine St., New York City, was given contract by board of control and supply to build a 200,000,000 gal. capacity regulating dam and 210-acre reservoir to take place of incomplete main reservoir across Moswansicut River at North Scituate. Cost, approx. $38,545. Work to consist of 960 cu. yds. concrete, 1,600 cu. vds. excavation, 12,300 cu. yds. embankment.

Seattle, Wash.—*Puget Mill Co., contractors, will lay water mains on Avalon way.

LIGHTING AND POWER

Fort Payne, Ala.—$14,000 worth of bonds will be issued for a municipal electric light plant.

Payne City, Ala.—Recent election resulted in favor of proposition to issue $14,000 electric light bonds. Tom Sawyer, Mayor.

Glendale, Cal.—Capital Issues Committee at San Francisco telegraphed advising City Attorney W. E. Evans and the public service department that it has approved the issue of 6 per cent. electric light bonds in the sum of $44,000 covering improvement district No. 2, in this city, for the purchase of the distributing system of the Southern California Edison Co. This property is located in the Gateway district, formerly Tropico. Mr. Evans says that this approval by the Capital Issues Committee means that the bonds will be placed on the market at once and the system probably will be taken over by Glendale within the next 30 days.

Fresno, Cal., is building a two-story power plant, reinforced concrete, 85x155 ft. in size, at Sun Maid City, south of Fresno.

Fresno, Cal.—Bids have been taken for proposed electrolier system on South Van Ness Ave.; lowest bids, $11,514.

La Habra, Cal., contemplates the installation of an electric light plant.

Santa Barbara, Cal.—Wants to install new reinforced concrete ornamental lighting standards in Chapala St., from Ocean blvd. to Gutierrez St.

Greenwich, Conn.—N. Y., N. H. & H. Railroad Co. has acquired approximately 18 acres of land along west bank of Mianus River to secure additional water supply for power plant service at its Cos Cob works.

Monticello, Fla., will spend $17,500 to install an electric light plant.

Wauchula, Fla.—Will spend $24,000 for an electric light plant.

Maquoketa, Ia.—$65,000 worth of bonds for a municipal light and power plant will be voted upon at a special election to be held Sept. 24. W. C. Morden, Mayor.

Muscatine, Ia.—Clona township has absorbed Farmers' Electric line and will erect pole line carrying two wires of 4,000 voltage, electricity to be furnished by Muscatine Lighting Co. F. S. Dewey, general manager.

Sadorus, Ill.—$6,500 worth of bonds were voted by taxpayers for constructing an electric light, heat and power plant.

Frankford, Ind.—$50,000 worth of bonds will be sold by the city to improve municipal light plant.

Buffalo, Kan.—Will vote Sept. 5 on a $20,000 electric light bond issue.

Glen Elder, Kan., is minus its electric light plant. It burned down the other day.

Portage La Prairie, Man.—A transmission line costing $325,000 to supply light and power to city may be constructed by city. Engineer, Robt. Pride.

Dana, Mass.—To secure electric light for village, committee has been appointed. Rolin D. Doubleday, Town Clk.

Escanaba, Mich.—Will extend its lighting system to Four River road.

Duluth, Minn., will install electric light wiring in hospital for contagious diseases.

Duluth, Minn.—City will install electric wiring in hospital for contagious diseases. Cost, $160.

Duluth, Minn.—See "Water Supply."

Dayton, O.—The Dayton Power & Light Co. has been authorized by the state public utilities commission to purchase the Waynesville power plant at Waynesville, Warren county, for $7,172. The Dayton company is contemplating erecting a newer line from Dayton to Waynesville and has asked authority to issue $30,000 capital stock for the purpose.

Novinger, Mo.—For the reconstruction of its electric plant, recently destroyed by fire, the Merchants' Light & Power Co. considering plans.

Palmer, Neb.—See "Water Supply."

Perth Amboy, N. J.—For installation of new meters and other equipment at municipal power system, City Council has approved plans. Jay Frank, City Electrician.

Syracuse, N. Y.—The bid of the Syracuse Lighting Co. for additional street lights will probably be rejected by the Mayor of this city in compliance with request to that effect by Municipal Lighting Commission. Purpose of rejection is desire for erection of municipal lighting plant.

Tottenville, N. Y.—The public service commission has requested the Richmond Light & Railroad Co. to make extensive improvements in its shops, etc.

Watertown, N. Y.—For construction of new municipal electric plant, city is having preliminary plans prepared; cost about $200,000. Thos. Tomlines, City Bank Bldg., Archt. and Engr.

Belhaven, N. C.—Bonds will be issued Sept. 16 for electric light, $25,000, 6 per cent.; for funding, $10,000, 6 per cent. Board of Aldermen.

Waurika, Okla., will soon have an electric light plant.

Philadelphia, Pa.—A generating plant for the Government will be constructed by Phila. Elec. Co., at the foot of Delaware river, to cost about $10,000,000. W. L. Eglin, architect.

Pittsburgh, Pa.—For construction of $5,000,000 power plant to supply Pittsburgh district, West Penn Power Co. has made arrangement with War Dept. Plant will be located at mouth of coal mine in Allegheny Valley and will develop 40,000 kw. $2,000,000 will be advanced by Ordnance Dept. and $3,000,000 will be furnished by private bankers. Cost is to include construction of transmission line to Pittsburgh district.

Pittsburgh, Pa.—For the new ordnance plant of the government on Neville Island a new generating plant will be installed to cost about $5,000,000.

Seven Pines, Pa.—The war department will make provision for electric light to be furnished to an industrial city of about 5,000-7,000 people.

Bonesteel, S. D.—Issue of electric light bonds, $14,000, purchased by Schanke & Co., of Mason City.

Dallas, Tex.—Gave Dallas Light & Power Co. authority to purchase 2,000 20-in. reflector fixtures to improve city lighting.

Seattle, Wash.—Action was taken by the finance committee of the council instructing City Engineer A. H. Dimock to proceed with the survey of the Skagit River power project, with a view to the immediate beginning of construction work on the big project. The first issue of bonds for the work, totaling $1,500,000, will be available Nov. 15, and in the meantime it is expected that the necessary funds for the preliminary work will be secured by borrowing from the general fund, the money to be returned after the bonds have been sold.

Seattle, Wash.—This year's installment of Skagit River power site bonds will be for the sum of $1,500,000 and will be dated Nov. 1. An agreement was reached at the meeting of tne finance committee of the city council Monday afternoon, following the meeting of the city council, at which a formal report of the Capital Issues Committee was submitted by the mayor, corporation counsel and chairman of the finance and franchise committees, the special committee which went to Washington to secure federal approval of the bond issue. Under the agreement the bonds will be issued as follows: $1,500,000 during 1918; $1,500,000 on or after July 1, 1919; $1,500,000 on or after January 1, 1920, and $1,000,000 on or after July 1, 1920.

Seattle, Wash.—Architect Carl F. Siebrand, of the Northern Life Bldg., drew plans for the erection of a wireless manufacturing plant for the Kilbourne & Clark Mfg. Co., corner East Margin at Way and Spokane St. Cost, about $80,000.

Seattle, Wash.—Contemplates purchase of material and supplies for lighting department.

Superior, Wis.—Board of Pub. Works received no bids for installation of new N. Tower Ave. "White Way" which has been agitated for by members of Superior Progressive Association composed of business men from that section of the city. Probably new bids.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

New London, Conn.—Contract for the installation of a heating system at the local naval station has been awarded by

the U. S. Government, Bureau of Yards and Docks, to *R. K. Bill Co., Springfield, Mass.

Barrington, N. J.—*Ordinance was passed by the borough council to enable Delaware & Atlantic Telegraph & Telephone Co. to construct poles and install electric conduits, etc., in the principal streets of Barrington.

Clifton, N. J.—The contract for the 1,500 ft. of fire hose was given to the *Eureka Co. and the *W. & G. Co.

Clifton, N. J.—*The American La France Co. was awarded contract for fire apparatus.

Ellis Island, N. Y.—*Almiral & Co., 1 Dominick St., New York, were awarded contract by U. S. Govt., Dept. of Immigration, to improve main power plant at local hospital.

Rutland, Vt.—The new shops of the Rutland Railroad Co. will be supplied with additional power to the extent of 500 hp. by the *Rutland Railway, Light & Power Co.

FIRE

Chino, Cal.—Volunteer organizations in San Bernandino county will soon need motor apparatus. County treasurer, Chino, Cal.

San Francisco, Cal.—Navy Yard will get a fire department. Proposals received at Navy Yard. About $53,000.

Bridgeport, Conn.—City council will buy new fire truck. Is asking for bids. President of council.

Washington, D. C.—Board of Awards, Dept. of Agriculture, will buy 15,000 ft. of cotton rubber lined spraying hose for Franklin, N. H.

Independence, Ia.—600 ft. of fire hose will be bought by city council.

Anderson, Ind., will soon invest $25,000 in additional fire apparatus.

Greenfield, Ind.—About 500 ft. of new fire hose is needed.

East St. Louis, Ill.—A new motor fire truck may be installed by this city.

La Salle, Ill.—La Salle Trust Co. purchased issue Fire Department bonds; $20,000. Wm. J. Morawitz, City Clk.

Eastport, Md., needs fire protection.

Clinton, Mass.—Town may need a new fire truck.

Leominster, Mass.—This town may buy some additional alarm apparatus.

Charlotte, Mich., plans to motorize fire system.

Pontiac, Mich.—$60,000 bond issue has been voted for fire protection.

Duluth, Minn., will buy six automobile tires for fire department. Cost, $466.02.

Duluth, Minn.—Fire hall will be repaired. Cost, $449.

Duluth, Minn.—City will buy a new crank shaft for fire truck. Cost, $538.64.

St. Paul, Minn.—City is in market for motor-drawn pumping engine and other motor equipment. City purchasing agent.

St. Paul, Minn.—$4,200 was appropriated to buy a new fire apparatus.

Poplar Bluff, Mo.—Fire apparatus of this city in poor condition. Will have to be renewed sooner or later. Particulars can be learned from the mayor.

Bloomingdale, N. J.—Has not enough fire hydrants. Citizens ask for more.

Fort Lee, N. J.—The town council may buy a motor fire engine.

Gibbstown, N. J., will buy new fire equipment.

Kenilworth, N. J.—Will soon have a new fire station.

Orange, N. J.—Orange will soon have a new hose company.

Wallington, N. J.—Contemplates purchase of $2,500 automobile fire apparatus.

Clarksville, N. Y.—A recent $30,000 fire proved that this town has not sufficient fire apparatus.

Dickinson, N. Y.—Town is organizing a fire department.

Hamburg, N. Y. — Is considering whether it will build a new $5,000 fire hall. The matter will be decided at a special village election.

Lansingburg, N. Y.—If this city decides definitely on buying a new motor equipment it will raise $35,000 for that purpose.

New York, N. Y.—Harlem will get more fire equipment.

Tarrytown, N. Y.—*H. S. Clark will furnish new fire house, $8,939.54.

When Belgium Stemmed the Tide

Four years ago the Belgian Army, war-worn and weak in numbers, confronted the Germans on the Yser. From Liege to the last narrow strip of their country they had resisted the invaders inch by inch, glorious even in retreat.

At the Yser the Belgians performed a signal service to the Allied cause by holding the Germans while the gaps were being closed in the Franco-British lines to the rear.

Four years have passed, and the same nations are still at death grips along the Western front. America, too, is there, and has this opportunity because the Belgians kept the enemy from crossing the Yser long ago.

The same unfaltering courage, the same inspiration for sacrifice in our army abroad and in our citizens at home will give us victory.

The complete mobilization of the whole people is necessary and the telephone service has an increasingly important part in speeding the national effort.

More than 12,000 members of the Bell System are in military service. Those that remain at home must fill the gaps and do their utmost, with the co-operation of the public, to help win the war.

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W.S.S. WAR SAVINGS STAMPS ISSUED BY THE UNITED STATES GOVERNMENT

Hudson, O.—Bonds will be issued Sept. 17 for fire department, $3,000, 5½%, 1-3 years. B. S. Sanford, village clerk.

Mason, O.—Additional fire equipment will be purchased by the fire department of this city. Money has been appropriated for that purpose. Particulars given by chief.

Norwood, O., is badly supplied with fire apparatus.

Paulding, O.—This town may buy a new chemical extinguisher as its old one [illegible] out.

Youngstown, O.—Bonds will be sold Sept. 23; fire department, $10,800; 5 per cent.; aver. 5 yrs. J. R. Edwards, city auditor.

Youngstown, O.—City will issue bonds Sept. 23 to buy a triple combination motor apparatus.

Youngstown, O.—This city will sell bonds Sept. 23 to buy triple combination motor apparatus.

Durant, Okla., will spend $12,000 for motor equipment.

[illegible]—$75,000 is to be invested by this town in fire apparatus. [illegible] Gesell.

Pawnee, Okla.—*International county will furnish city with combination chemical and hose truck.

Astoria, Ore.—Council wants bids for 1,000 ft. of 2½-in. fire hose and for motor truck tires.

Corry, Pa.—Corry will install 4 additional fire alarm boxes.

Erie, Pa.—An $80,000 alarm system, like the one in Atlanta, Ga., will probably be bought by Erie. Details furnished by president of council.

Johnsonburg, Pa.—This town will soon buy a new fire truck. Funds are being raised for that purpose.

Erie, Pa.—Fire hydrants are not in good condition.

Harrisburg, Pa.—Bids on fire hose received, $2,500. Commissioner Gross.

Johnsonburg, Pa., intends to buy a new fire truck.

Philadelphia, Pa.—City had a fire engine damaged in a fire.

Washington, Pa.—Is in line for an addition to its fire apparatus.

West Brownsville, Pa.—This town is raising money to buy a combination hose and pumping station.

Buchanan, Va.—Will install adequate fire system.

Buchanan, Va., intends to buy adequate fire equipment.

Mullens, W. Va.—Town has no fire system.

Phoebus, Va., intends to invest in a new fire engine.

West Dummerston, Vt.—Town realizes it needs a fire system. So far it has not any.

Seattle, Wash.—Contemplates following purchases: Two new fire stations, $15,000 and $10,000; fire engine house, $350; repairs to building, $3,000; repairs to apparatus, $5,000; four motor pumping engines and 75 ft. aerial truck, $70,000; one auto, $2,500; two Ford autos, $1,000.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Lake Charles, La. — *American-La France Fire Co., Syracuse, N. Y., for a complete motorized Fire Dept. equipment.

Walla Walla, Wash.—*T. S. Steele Machine Co. for new auto fire truck chassis authorized for Fire Department by City Comn.

BRIDGES

Santa Barbara, Cal.—Bids for bridge in Santa Barbara County were rejected and Commission will build structure with day labor.

Melbourne, Fla.—*Contract for a bridge over Indian river let to Indiatlantic Constr. Co., General Theo. Eissfeldt, general manager.

Grundy Center, Ia., rejected all bids for bridge in Grundy county. G. L. Eggleston, county auditor.

Caldwell, Ida.—Bonds which town intends to sell are for purpose of building three bridges across Snake River to unite Canyon and Owyhee counties.

Leavenworth, Kan.—Is going to repair bridge over Missouri river. W. V. Thomas, county surveyor, Leavenworth county.

Wichita, Kan.—Contemplates building a reinforced concrete bridge over Chisholm Creek.

Charlton, Mass.—$32,000 will be spent on a reinforced concrete bridge, for which bids will soon be asked. Edw. A. Lamb, chairman of selectmen.

Springfield, Mass.—City will repair its old toll bridge. Engr., J. P. Snow, Boston.

Salem, Mass.—The city has not yet received permission from the national finance board to issue bonds to meet its portion of the expense of the reconstruction of Beverly bridge. This sum, being in excess of $100,000, requires sanction of the national board rather than the state board.

Springfield, Mass., will build a bridge over Connecticut River from Springfield to West Springfield. Cost, $50,000-$100,000. John L. Bates, Chm. Hampden county, 72 Tremont St., Boston, Mass.

Billings, Mont.—The government will furnish monetary aid for the reconstruction of the Hutley bridge over the Yellowstone, and for the replacement of another bridge four miles from Billings, according to Charles A. Kyle, member of the state highway commission.

Butte, Mont.—Another attempt is to be made to replace the old wooden bridge over Silver Bow creek on South Montant St. with a concrete structure. The contract calls for an expenditure of $12,000.

Great Falls, Mont.—Wells-Dickey Co., Minneapolis, successful bidders for two issues of bridge bonds amounting to $500,000 issued by Cascade county for 2 bridges across Missouri River at Great Falls, Mont. Wells-Dickey Co. offered 4¾% interest on issue of $224,000 and $10 premium and 5% on issue of $243,000 and $10 premium.

St. Louis, Mo.—Upon recommendation all bids for constructing a reinforced concrete bridge over the Oak Hill tracks at Southwest Ave. were rejected.

Absecon, N. J.—*Foundations and abutments for bridge over Absecon creek will be built by Sutton & Corson, Ocean City; $20,000.

Perth Amboy, N. J.—A 150-ft. drawbridge between this place and Tottenville, S. I., will be built. City clerk.

Cincinnati, O.—No bids received for construction work planned on Kentucky river locks and dams.

Lake County, O.—Bids will be received Sept. 23 for St. Clair St. viaduct or Hines bridge; $40,000; 5½ per cent. W. Albert Davis, county auditor, P. O., Painesville.

Zanesville, O.—Zanesville wants to build a bridge on Third St. Engr., K. H. Strait, Court House.

Atoka, Okla.—Bonds amounting to $98,750 for a new bridge have been voted. City clerk.

Perry, Okla.—A bridge, 1 50-ft. span, 2 60-ft. span, 18-ft roadway, concrete substructure and floor, is going to be built by Perry. Plans for it prepared. H. J. Wilkins, 606 Majestic Bldg., Okla., city engineer.

Baker, Ore.—Three steel bridges, one at McCarthy Place, one at Deer Creek, north of McEwen, and the third in Pine Valley, north of Halfway, will be constructed by Baker county. W. Duby, county judge.

Roseburg, Ore.—During a session of the county court the county roadmaster was ordered to prepare plans and specifications for a bridge below the town of Oakland, to connect with the Green Valley road, and the county clerk was instructed to advertise for bids for construction of said bridge. The new route is practically level.

Brookhaven (Chester P. O.), Pa.—*Whitaker & Diehl, Union Trust Bldg., Harrisburg, were given contract by commissioners of Delaware county, Media, to build 56 ft. reinforced concrete bridge 28 ft. wide.

Harrisburg, Pa.—*Paul D. Kauffman, Reading, submitted lowest bid for bridge in lower Marion township, Montgomery county, $11,203.19.

Hummelstown, Pa.—Dauphin county will build 4-span reinforced concrete bridge over Swatara creek, earth-filled arches, with approach. Bids received from G. Merdinger, Wilburt Trust bldg., South Bethlehem, $12,600; S. W. Shoemaker & Son, 1545 N. 6th St., Harrisburg, $174,500.

Sunbury, Pa.—A reinforced concrete bridge over Chillisgague Creek will be built by Northumberland county. Approximate cost, $18,000. Engr., M. J. Flynn, Fourth and Oak St., Mount Carmel.

Hillsville, Va.—A bridge over Crooked Creek, costing about $50,000, is going to be built by Carroll county.

Spotsylvania, Va., will reconstruct its bridges and intends to spend $10,000 on the job. County clerk.

Aberdeen, Wash.—Council has declared an emergency to exist and has passed an ordinance calling for the redecking of the span and the reconstruction of the approaches to the A. J. West bridge across the Chehalis River, and the redecking of the span and approaches of the Heron St. bridge.

Chehalis, Wash.—Lewis county will retimber the present 142-ft. span over the Cowlitz river near Harmony, known as bridge No. 21. It will also build a new 136-ft. steel arch bridge for the same location.

Chehalis, Wash.—County commissioners have called for bids for raising of the steel bridge and building of a concrete abutment on the Davis Lake road, over the Kildon river, near Morton.

Montesano, Wash.—Five bridges on the Olympic highway, between Aberdeen and Montesano, are to be rebuilt, according to information by H. S. Shorey, county engineer. New bridges will be of plank.

Walla Walla, Wash.—U. S. Reclamation Dept. contemplates the utilization of the power of the Snake river for irrigation. The plan would involve the construction of a dam across the Snake and the building of locks to permit the passage of river boats.

Sheboygan, Wis., will build a steel bridge 220 ft. long, concrete abutments. King & Smith, engrs., Mack Bldg., Milwaukee.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

San Diego, Cal.—*Pacific Bldg. Co., 334 C St., will construct a 960-ft. reinforced-concrete pile trestle bridge over San Diequito River. Approx. cost, $72,950.

Byers, Colo.—*Adams county gave contract for a steel bridge over Bijou creek to Levi Constr. Co. Bridge will be 120 ft. long; cost, $9,420.

Bristol, Conn.—*Cosmo Vacca has contract for building two bridges, one at Jerome Ave., the other at Franklin St.

Wilmington, Del.—State Highway Comn. let two contracts for building concrete arch bridges: *Luten Bridge Co., West Market St., York, Pa., for bridge on Sect. 4, Lincoln Highway; *Elwood Talley, repairing Barkers bridge, $12 per cu. yds. masonry and $1.70 per cu. yd. for embankment.

Bradentown, Fla.—Bridge over Manatee River, between this city and Palmette, will be built by *E. W. Paker, Tampa, $54,810.

Champaign, Ill.—*C. L. Lindsey, of Mahomet, for building bridge and Bosdeck culvert which are on county line between Champaign and Douglas County, at $2,100. Road and Bridge Committee of Board Supervisors of Champaign County, E. C. Fairclo, Supt. of Highways.

Great Lakes, Ill.—Contract for road and bridge building let to *Schmidt Construction Co., 105 N. Clark St., Chicago Owner, U. S. Government, $30,000.

La Harpe, Ill.—*Contract for La Harpe bridge in Durham township, Hancock county, was given to Wm. J. Fowler; $6,100.

Salem, Ill.—Fourteen bridges will be built in Marion county by the following people: *W. C. Johnson, Belleville; *F. M. Sherman, Dix; *B. F. Clark & Son, St. Louis, Mo.; *T. E. Irvin, Patoka; *R. E. Gregory, Alona, and *A. J. Sliger, Centralia. Work involved 970 cu. yd. concrete and 79,000 lb. reinforcing steel. About $23,000.

Indianapolis, Ind.—The county commissioners let five bridge contract. *Edward F. Smith of Marion county was awarded bridge No. 14 on a bid of $1,046; *George H. Collins of Winamac, Ind., was awarded bridge No. 9 with a bid of $820, and No. 16, with a bid of $870; *John W. Kernodle of this city was awarded bridge No. 15, bidding $518, and *George T. Miller of this city was awarded bridge No. 19, bidding $3,887.

Boston, Mass.—*M. S. Kelliher, 379 Neponset Ave., Dorchester, is doing bridge repairing for $7,647.75.

Lansdowne, Man.—*O. W. Smith Construction Co., 5228 Seventh St., Regina, Sask., received contract from municipal council to build reinforced concrete bridge.

Fond du Lac, Minn.—*G. H. Lounsberry, 1 Morgan Park, Duluth, will build bridges over St. Louis River for St. Louis county. Approximate cost, $108,000.

Kanaranzi, Minn.—*P. N. Gillham, Luverne, will build 2 bridges, 10 and 16-ft. spans, to cost $675 and $900 each.

Lincoln, Neb.—*A. A. Dobson Co. will build a $4,000 bridge and *Pioneer Construction Co. will build a $16,000 bridge for Lancaster county.

Pompton Lake, N. J.—Contract has been let for new bridge and culvert extension at Pompton Lakes to *Magee & Dreher, 9 Pearl St., Paterson.

Tiffin, O.—County comrs. of Seneca county awarded the following contracts for bridge building: *Perry A. Yundt, bridge in Reed township, $468; *L. W. Rean, repairing bridge in Bloom township, $228; *L. W. Dean, repairing abutment in Eden township, $282.

Allentown, Pa.—*Lehigh county commissioners gave contract for rebuilding stone bridge over Saucon creek, in Center Valley, to Butz & Clader, $9,875.

West Chester, Pa.—*Howard Bevan was given contract by Chester county comrs. to repair bridge over Buck River, New Line township, $705.

Montreal, Que.—*Frazer, Brace & Co. for completion of La Salle bridge.

St. Sylvere, Que.—*Nicolet Construction Co., Nicolet, for iron and steel bridge, $29,000. Municipal Journal.

East Greenwich, R. I.—*G. F. Austin, Box 24, Providence, was awarded contract for Big River bridge by state board public roads. Bridge to be of reinforced

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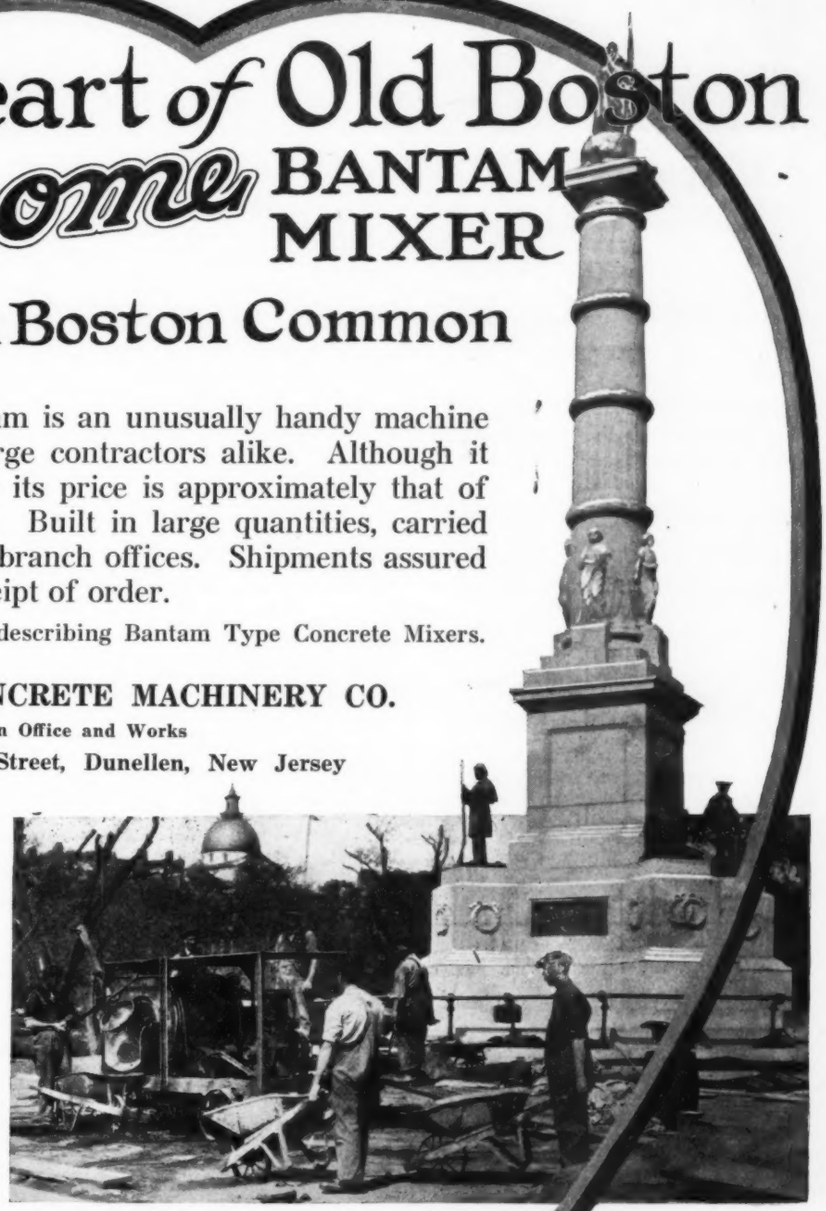

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Bids received until October 2, 1918.

Highway Improvements

STATE OF NEW JERSEY
STATE HIGHWAY COMMISSION
TRENTON

Notice is hereby given that sealed bids will be received by the State Highway Commission of New Jersey for the improvement of the following:

STATE HIGHWAY ROUTE NO. 5, SECTION 1A—Bituminous Concrete Surface (Warrenite); estimated, 48,880 square yards. Morris County.

STATE HIGHWAY ROUTE NO. 14, CAPE MAY-RIO GRANDE SECTION—Concrete Surface; estimated, 48,580 square yards. Cape May County.

Bids will be opened and read in public at the office of the State Highway Commission, Broad Street Bank Building, Trenton, N. J., on Wednesday, October 2, 1918, at 10:30 A. M.

Drawings, specifications and forms of bid, contract and bond for the proposed work are on file in the office of the said Department, at Trenton, N. J., and in the offices of Roy Mullins, Division Engineer, 503 Market Street, Camden, N. J., and E. M. Vail, Division Engineer, 790 Broad Street, Newark, N. J., and may be inspected by, or furnished on, deposit of ten dollars ($10) to prospective bidders. Bids must be made on the standard proposal forms in the manner designated therein and as required by the specifications, same to be enclosed in sealed envelopes bearing the name and address of bidder and name of the road on the outside, addressed to State Highway Commission, Broad Street Bank Building, Trenton, N. J., and must be accompanied by a certified check for not less than ten per cent. (10%) of the amount of the bid, and be delivered at the above place on or before the hour named. Copies of standard proposal form will be furnished on application.

Each bidder must accompany his bid with a certificate from a surety company, duly authorized to do business in this State, stating that such surety company will provide said bidder with a bond in such sum as is required in, and in accordance with, the provisions of said specifications, conditioned for the faithful performance of the provisions of the contract and specifications.

By order of the State Highway Commission.

A. LEE GROVER, Chief Clerk.

Bids received until November 25, 1918.

Garbage and Refuse Incinerator

OFFICE OF THE MAYOR OF SAN JUAN, PORTO RICO.

San Juan, P. R., August 20, 1918.

Sealed proposals will be received by the Commission of Awards at the office of the Mayor, Ayuntamiento Building, City of San Juan, P. R., until 10:00 o'clock A. M., on November 25, 1918, for the construction and installation of a Garbage and Refuse Incinerator Plant at Miramar, San Juan, P. R.

At the above place and time the bids will be publicly opened and read. Instructions to bidders, topographical plan of site of work, and general specifications can be obtained either from the City Engineer, San Juan, P. R., or from the Bureau of Insular Affairs, War Department, Washington, D. C.

The right is reserved to reject any and all bids.

R. H. TODD,
Mayor of San Juan, P. R.

TREASURY DEPARTMENT, Supervising Architect's Office, Washington, D. C., September 12, 1918.—Sealed proposals will be opened in this office at 3:00 P. M., October 7, 1918, for the construction (except the mechanical equipment) of the United States Immigration Station at Boston, Mass. Drawings and specifications may be obtained from the Supervising Chief Engineer, Room 137, Post Office Building, Boston, Mass., or at this office in the discretion of the Supervising Architect. JAMES A. WETMORE, Acting Supervising Architect.

concrete, 56 ft. long, 40 ft. span, with 30 ft. roadway, involving 250 cu. yds. concrete, 3,225 cu. yds. earth fill.

Cedarburg, Wis.—*John Vollman will build concrete bridge, 2 40-ft. spans; $4,950.

Milwaukee, Wis.—*F. W. Taddy, Milwaukee, will build for city a concrete bridge over Kinnickinnic River at Cleveland Ave. Approxmiate cost, $10,860.

Oconto, Wis.—*Messenger & Rasmussen will build local bridge.

Saxon, Wis.—*Fabion Co., Hurley, was successful bidder for construction of reinforced concrete bridge, in neighborhood, to be of 15 ft. span; $1,180.

MISCELLANEOUS

Yuma, Ariz.—$15,000 will be cost for repair of the levee. It will be done immediately.

Denver, Colo.—The city has suffcient money to pay the following bonds: Storm sewer bonds: Washington Park Storm Sewer Dist. Bonds Nos. 156 and 157; West Denver Storm Sewer Dist. No. 1, Bond No. 86. Sanitary sewer bonds: West and South Side Sanitary Sewer Dist. Bonds Nos. 392 and 393; Part A, Sub District 3, West and South Side Sanitary Sewer Dist. Bond No. 60. Improvement bonds: East Denver Imp. Dist. No. 3, Bond No. 85; East Side Imp. Dist. No. 1, Bond No. 131; North Side Imp. Dist. No. 18, Bond No. 24; North Side Imp. Dist. No. 23, Bond No. 35; South Denver Imp. Dist. No. 4, Bond No. 93. Paving bonds: Alley Paving Dist. No. 17, Bond No. 27; Alley Paving Dist. No. 43, Bond No. 7; Alley Paving Dist. No. 47, Bond No. 4; Alley Paving Dist. No. 48, Bond No. 6; Montclair Parkway Suburban Paving Dist. No. 1, Bond No. 60. Park bonds: East Denver Park Dist. Bonds Nos. 1178 to 1182 inclusive. Surfacing bonds: Surfacing Dist. No. 4, Bond No. 31. They are being called in for payment and interest on them will cease on Sept. 30, 1918.

New London, Conn.—Bureau yards and docks navy dept., Washington, D. C., plans to build distributing system. Spec. 3385. About $275,000.

Washington, D. C.—The war department authorizes the following: The construction division has been authorized to make additions to the Schenectady quartermaster's interior storage at Schenectady, N. Y.; cost $1,498,500.

Quincy, Fla.—Bids will be received until Sept. 21 by board of commissioners of Gadsden county, F. F. Morgan, clerk, for $30,000 of bonds; 6 per cent.; payable annually; principal payable as follows: Nos. 1 to 3, $1,500, July 1, 1919; 3 to 5, $1,000, July 1, 1920; 5 to 8, $1,500, July 1, 1921; 8 to 10, $1,000, July 1, 1922; 10 to 13, $1,500, July 1, 1923; 13 to 16, $1,500, July 1, 1924; 16 to 19, $1,500, July 1, 1925; 19 to 22, $1,500, July 1, 1926; 22 to 25, $1,500, July 1, 1927; 25 to 29, $2,000, July 1, 1928; 29 to 33, $2,000, July 1, 1929; 33 to 37, $2,000, July 1, 1930; 37 to 41, $2,000, July 1, 1931; 41 to 45, $2,000, July 1, 1932; 45 to 50, $2,500, July 1, 1933; 50 to 55, $2,500, July 1, 1934; 55 to 60, $2,500, July 1, 1935.

Macon, Ga.—Bonds will be sold Sept. 17 as follows: Sewer, $55,000, 4½%, 17 5-6 years; auditorium, $55,000, 4½%, 17 5-6 years; hospital, $75,000, 4½%, 5 to 29 years; Park building, $15,000, 4½%, 5 to 29 years. David S. Jones, clerk of city council.

Indianapolis, Ind.—City council intends to spend $100,000 for adidtional buildings and improvements at the Marion county tuberculosis hospital. The ordinance for the appropriation, which had its first reading today, provides that the expenditure shall be met by a bond issue to run 20 years.

Medford, Mass.—Commonwealth Trust Co., of Boston, purchased temporary loan bonds; $50,000.

Newton, Mass.—Successful bidder for issue temporary loan bonds, $100,000, was Boston Safe Deposit & Trust Co.

Duluth, Minn.—City will lay concrete floor at hospital for contagious diseases. Cost, $486.

Underwood, N. D.—Kalmann, Matteson & Wood, St. Paul, bought $5,000 bond issue for village hall.

Pedricktown, N. J.—War department bought tract of about 2,000 acres of land near this town, to be used for the Delaware depot of the ordnance department.

Cape May, N. J.—For about $66,000 bureau yards and docks, navy dept., Washington, D. C., plans to build foundation for gas holder. Spec. 3390.

Gloucester, N. J.—Bureau yards and docks, navy dept., Washington, D. C., plans to construct seaplane storage building, about $20,000. Spec. 3381.

Irvington, N. J.—A resolution providing for the purchase of a combination motor patrol and ambulance for use in the police department was passed by the Irvington town commission. Director of Public Safety Leonard Setaro was authorized to call for proposals to be opened Sept. 16.

Newark, N. J.—Glen Ridge borough council voted to enter into a contract for use of the Passaic Valley flume.

Newark, N. J.—Director Archibald, of the department of revenue and finance, sold $700,000 in tax anticipation bonds to Brown Bros. & Co. of New York for 4.18. These bonds will bear date of September 5 and are payable March 5 next.

Schenectady, N. Y.—City sold five months' certificates of indebtedness, to amount of $250,000, to S. N. Bond & Co., of New York; premium, $2.75. Leon G. Dibble, City Comptroller.

Cincinnati, O.—Hamilton county will issue bonds; $500,000, 5 per cent., for completion of building of new court house for Hamilton county, Ohio.

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4 inches—$2.40 an inch
8 inches— 2.30 an inch
15 inches— 2.20 an inch
30 inches— 2.10 an inch
98 inches— 2.00 an inch

Proposal Ads

$2.00 an inch an insertion

HOISTING ENGINES

	Price
1—6¼x10 American DCDD, with boiler	$1,000
1—7x10 Lidgerwood DCDD, with boiler	1,100
1—7x10 Lambert, 3 drum, with boiler	1,600
1—8x12 Mundy DCDD, with boiler	1,300
1—9x10 Lidgerwood, 3 drum, 32" drums, without boiler	1,900
With boiler	2,300
1—5x8 DCDD Reversible O&S, with vertical engine, without boiler	350
With boiler	550
1—7x10 Lambert DCDD, with boiler	1,100

COMPRESSORS

	Price
1—12x12 Laidlaw-Dunn-Gordon, belt driven, capacity 300′	$750
1—12x12x16 Ingersoll, straight line, steam driven, capacity about 300′ at 80 to 100 lbs.	800
1—Sullivan, 2 stage air, simple steam, capacity 1800′ at 80 to 100 lbs.	2,500
2—14x12 Bury Duplex, belt driven, capacity about 550′ at 60 to 80 lbs., each	1,000
1—14x16x10x16 Sullivan, 2 stage air, simple steam, capacity 600′ at 80 to 100 lbs.	1,500
1—14x9x10 Bury, 2 stage, belt driven, capacity 350′	1,500
1—Ingersoll-Rand Imperial Type XB2, 500′	2,000

DRAGLINES

	Price
1—Monighan-Walker steam machine, with 50′ boom, 1½ yd. bucket, almost new	$7,000
1—Flory outfit engine 10x12 heavy dragline type boiler, firebox 150 lb. pressure; boom, 60′; steel bucket, 2 yd.; new, 1917	9,000
1—24 Bucyrus, with 85′ boom	—

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TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
			STREETS AND ROADS.	
Ark.,	Harrisburg	Sept. 24.	16.7 miles of road	S. T. Mayo, Co. Judge.
Minn.,	Mantorville	2 p.m., Sept. 24.	16,000 cu. yds. of earth and hauling and placing 4,200 cu. yds. gravel; 4.81 mi. grading, 27,000 cu. yds. earth and hauling and placing 5,800 cu. yds. gravel	State Highway Dept., Guardian Life Bldg., St. Paul, Minn.
Minn.,	Anoka	11 a.m., Sept. 25.	20,400 cu. yds. gravel	Arthur A. Caswell, Co. Aud.
W. Va.,	Williamson	Sept. 26.	8 miles earth road	Blake Taylor, Co. Road. Engr.
O.,	Cincinnati	noon, Sept. 30.	Grading, setting granite curb, paving with asphalt and constructing necessary drains and inlets and laying 6-inch water mains	Chas. F. Hornberger, Dir. of Public Service.
O.,	Canton	10 a.m., Sept. 30.	1,615.2 cu. yds grading	W. C. Schick, Co. Clk
La.,	Shreveport	10 a.m., Oct. 1.	Constructing 9.11 mi. improved earth road involving 55,000 cu. yds. earth excavation, including grubbing, 180 lin ft. 24-in. concrete pipe, concrete culverts and bridge work	W. F. Cooper, Parish Engr.
Ala.,	Ozark	Oct. 1.	Improving 3 miles of road	County Clerk.
			SEWERAGE.	
O.,	Cincinnati	noon, Sept. 23.	Sewer construction	Chas. F. Hornberger, Dir. of Public Service.
Minn.,	Worthington	2 p.m., Sept. 27.	Drainage ditch construction involving 12,664 cu. yds.	Gus Swanberg, Co. Aud.
N. J.,	Newark	9:30 a.m., Oct. 8.	Constructing superstructure of effluent controlling chamber and two sections of intercepting sewer	Passaic Valley Sewerage Com., 31 Clinton St.
			WATER SUPPLY.	
Pa.,	Philadelphia	Sept. 23.	Constructing water supply system near city (Specification No. 3396)	Bur. of Yards & Docks, Navy Dept., Washington, D. C.
Minn.,	Columbia Hgts.	8 p.m., Sept. 24.	About 1,750 ft. 4-inch water mains	John W. Shaffer & Co., Engrs., New York Life Bldg., Minneapolis, Minn.
S. D.	Garretson	8 p.m., Sept. 25.	Improving water works, including well and pumping station, installing motor and triplex pump and 1,416 ft. 6-inch water main	C. O. Berdal, City Aud.
			FIRE EQUIPMENT.	
N. J.,	Lakewood	8 p.m., Sept. 23.	Combination hose and chemical motor truck, price not to exceed $4,500	Dewitt Matthews, Secy. Fire Comrs.
N. J.,	Cape May	Sept. 23.	Installing fire alarm system at barracks, to cost about $7,000 (Specification No. 3422)	Bur. of Yards & Docks, Navy Dept., Washington, D. C.
Wash.,	Bellingham	Sept. 30.	Triple combination fire truck, to cost about $12,000	Fire Chief Stearns.

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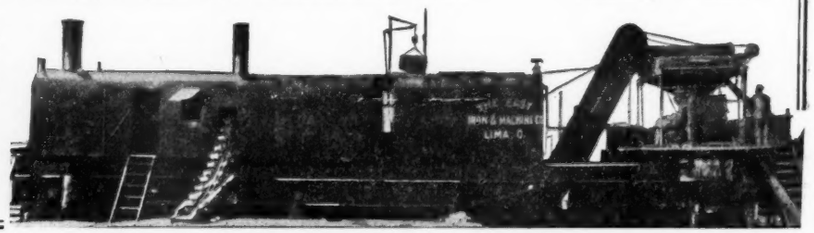

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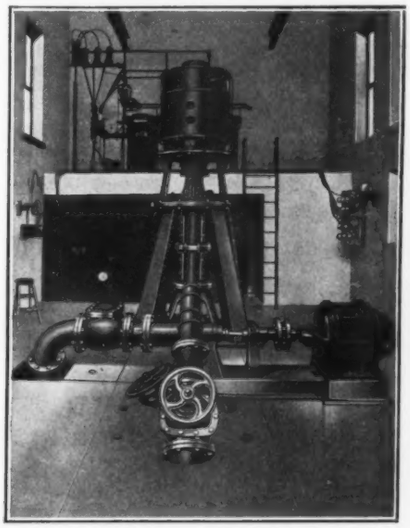

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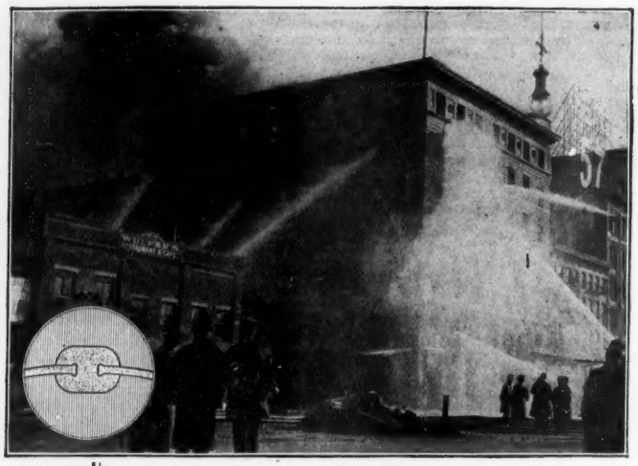

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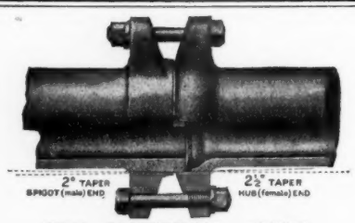

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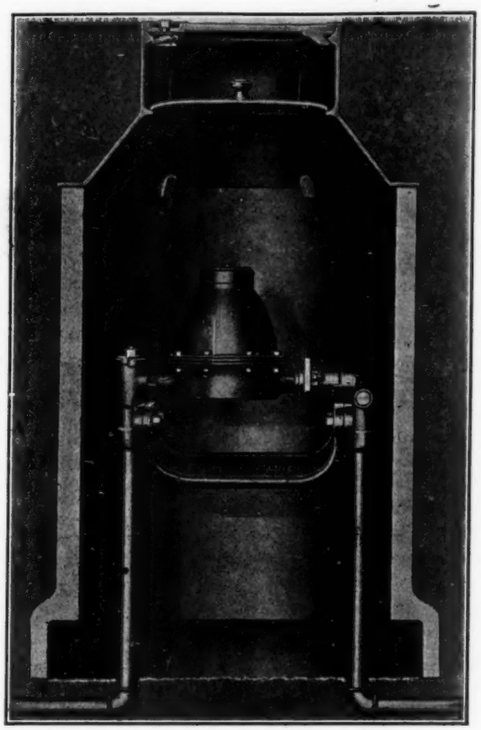

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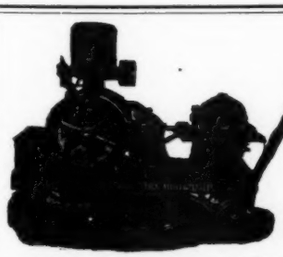

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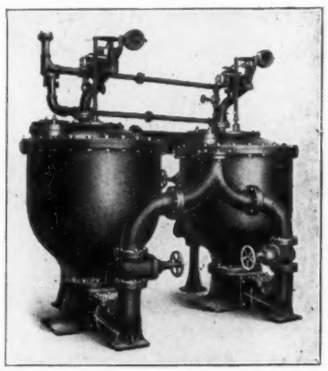

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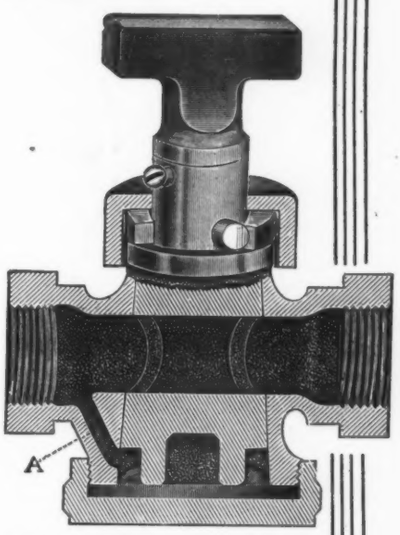

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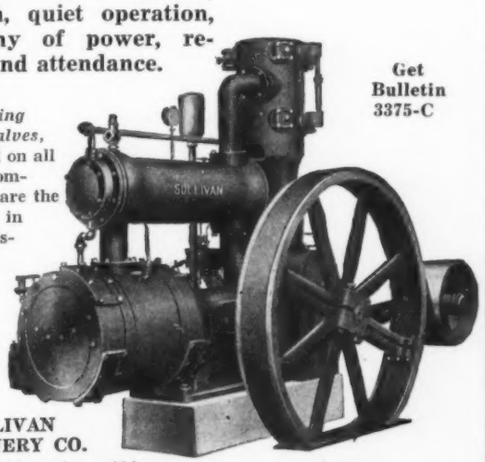

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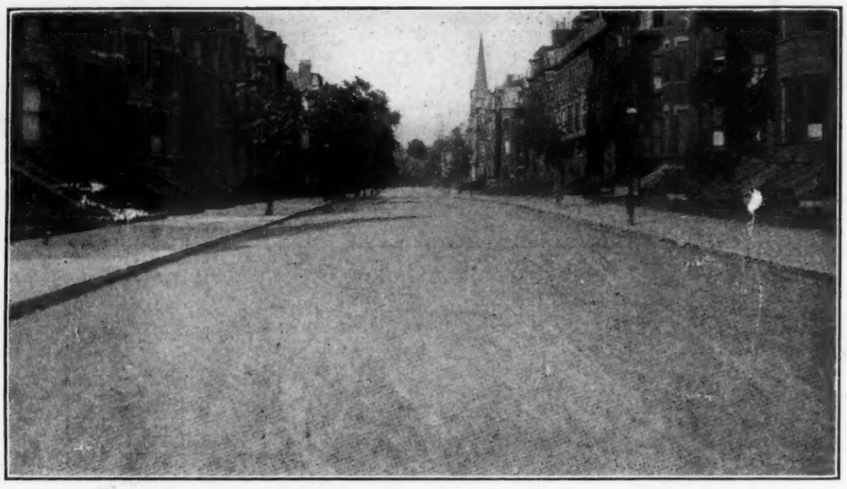

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